A HISTORY

OF THE

BIRDS OF CEYLON.

BY

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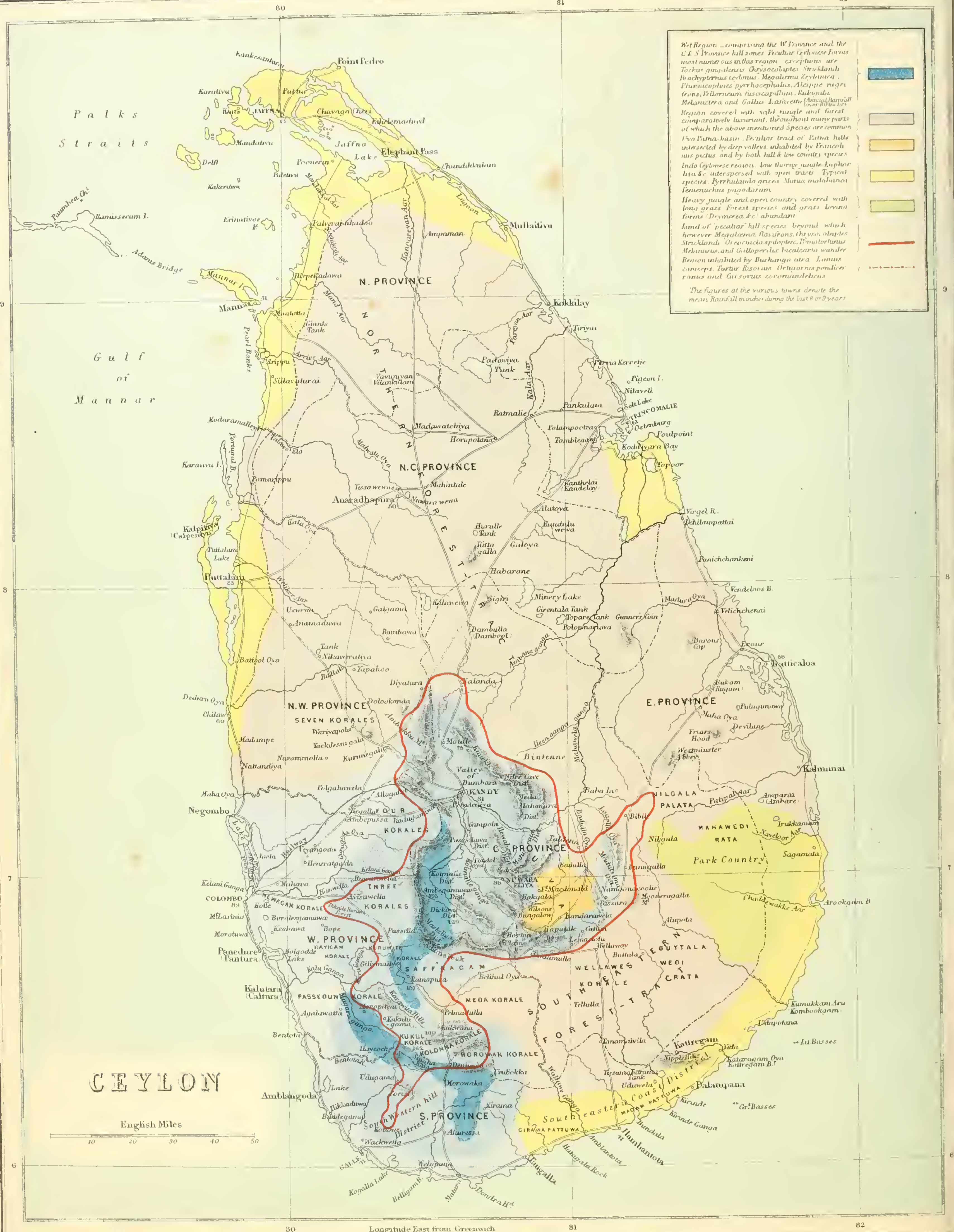
ETC., ETC.

LONDON:
PUBLISHED BY THE AUTHOR.
1880.


CEYLON
English Miles
10 20 30 40 50
Longitude East from Greenwich
80
81
82
The figures at the various towns denote the mean Rainfall in inches during the last 8 or 9 years
Palks Straits
Gulf of Mannar
N. PROVINCE
NORTHERN FOREST TRACT
N.C. PROVINCE
N.W. PROVINCE
SEVEN KORALES
E. PROVINCE
C. PROVINCE
W. PROVINCE
S. PROVINCE
SOUTH EASTERN FOREST TRACT
South eastern Coast District
South Western hill District
Park Country
MAHAWEDI RATA
NILGALA PALATA
FOUR KORALES
THREE KORALES
SAFFRAGAM
Point Pedro
Jaffna
Elephant Pass
Mullaitivu
Mannar I.
Adams Bridge
Kokkilay
Trincomalie
Anaradhapura
Puttalam
Kalpitiya
Batticaloa
Kandy
Negombo
Colombo
Kalutara
Bentota
Amblangoda
Galle
Dondra Hd.
Hambantota
Kumana
Kalmunai
Badulla
Nuwara Eliya
Ratnapura
Kurunegala
Dambulla
Matale
Polgahawela
Panedure
Morotuwa
Engraved by E. Weller Red Lion.

ALERE FLAMMAM.

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TO

HIS ROYAL HIGHNESS

ALFRED ERNEST ALBERT, DUKE OF EDINBURGH,

K.G., K.T., G.C.M.G., P.C., ETC.,

THIS WORK IS DEDICATED,

BY SPECIAL PERMISSION,

IN MEMORY OF THE VISIT OF HIS ROYAL HIGHNESS TO CEYLON

IN THE YEAR 1870.

BY HIS OBEDIENT HUMBLE SERVANT,

THE AUTHOR.

PREFACE.

Of late years Ornithology has made more rapid strides than perhaps any other branch of zoological research. In Oriental regions more particularly many naturalists have, within the last quarter of a century, prosecuted their studies with the greatest vigour; enormous collections have been made, entirely new regions explored, and their avifauna investigated with all that energy which collectors of the 19th century bring to bear on their work and doings in the forests of the tropics. The pens of Blyth, Jerdon, Wallace, the Marquis of Tweeddale, Swinhoe, Père David, and Allan Hume have brought our knowledge of the avifauna of India and the countries to the eastward of it to a high degree of perfection. At the time of the author's arrival in Ceylon much had been done by Layard, and the results of his labours were being largely added to by the researches of Mr. Holdsworth; but nevertheless, up to that period, no complete treatise on the birds of the island had been written. As a rising British colony, with fast-developing resources and wealth, an increasing European community, and an educated element in the native population, the production of a book on its avifauna which should take a place in the series of zoological works which are invariably the outcome of civilization seemed to the author a positive necessity.

This idea was combined with a strong desire to create a taste for natural history in the minds more particularly of the educated native community, and the hope of founding an ornithological school in Ceylon, such as had been the effect of the labours of Jerdon in the Indian empire.

With this view, therefore, the author devoted his entire spare time during an 8½ years' residence in the island to the study of its ornis and the amassing of a large collection of specimens. Towards the close of his work he received no little encouragement in a promise of help from the Government made to him by the late Governor, Sir William Gregory, who, during his term of office in Ceylon, did so much for the advancement of science in all its branches, and to whom the author is much indebted for his recent exertions with the existing Government on his

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behalf. On his return to England in 1877 it only remained for the author to combine his acquired knowledge of the life-history of the birds of Ceylon with a comparison of his collection (the largest ever made by one individual in the island) with series of specimens and skins in the British Museum and the collections of brother ornithologists in London, illustrative of the ornis of adjacent countries; and after three years of *incessant* labour the work has been brought to a conclusion.

A non-residence in London, within daily reach of the libraries, with their stores of ornithological literature, and the collections with which that great civilizing centre teems, has been a serious disadvantage to the author. Furthermore the vast amount of correspondence and supervision which the publication of the work entailed on him was much increased by his residence at a distance from those engaged in its printing and illustration. The scientific reader will therefore, it is to be hoped, pardon the various shortcomings which the author feels must, on this account, exist throughout the work.

Its mission, however, is not to impart knowledge to the scientific ornithologist in Europe, for it cannot pretend to any such degree of merit; it is intended purely as a text-book for the local student and collector in Ceylon; and though the author has as yet met with comparatively little support among the class for which he has worked so hard, yet if he succeeds in inculcating in the minds of only a few of the inhabitants of Ceylon a taste for the study of birds, which he apprehends must always rank foremost among the wonderful creations of an all-wise and bountiful Providence, his labour of love will not have been in vain. On the other hand, while his sincerest gratitude is evoked by the patronage which the Royal Family have been graciously pleased to bestow upon his humble labours, the author cannot but tender his best thanks to his friends and the general public in England for the cordial manner in which they have supported him.

W. V. LEGGE,
Captain R.A.

Aberystwith, September 2, 1880.

INTRODUCTION.

The island of Ceylon, although it contains none of those remarkable forms which characterize the birds of some of the Malay islands, undoubtedly possesses a rich avifauna; and, considering its geographical area (about five sixths that of Ireland), the number of species is very large. The tropical position of Ceylon, coupled with its location in the path of the monsoon winds and rains, fosters the growth of luxuriant vegetation and verdant forests, which, as a matter of course, teem with all that wonderful insect-life necessary for the sustenance of birds, and hence the large number of resident species inhabiting it; whilst the fact of its being situated at the extreme south of an immense peninsula makes it the finishing point of the stream of Waders and Water-birds which annually pass down the coasts of India; and, lastly, the prevalence of a northerly wind at the time of the migration of weak-flying Warblers brings these little birds in numbers to its shores.

The abundance of the commoner species inhabiting the cultivated country near the towns on the west coast, and the semicultivated interior traversed by the railway and the highroads leading to the principal towns, at once strikes the traveller on his arrival in the island; and the wonderful variety of bird-sounds heard during the course of a morning stroll, though they cannot vie in sweetness with the notes of the denizens of English groves, are, notwithstanding, quite as attractive. The laughing voice of the larger Kingfishers, the extraordinary booming call of the "Jungle-Crows" (*Centropus rufipennis* and *C. chlororhynchus*), and the energetic shouts of the Barbets when first heard fill the European traveller with astonishment, and more than compensate for the absence of the mellifluous voice of the Thrush and Blackbird.

As regards brilliancy of plumage, when we consider the tropical nature of their abode, the birds of Ceylon are decidedly mediocral. We find but little of that conspicuous beauty which characterizes the avifauna of many of the islands of the Austro-Malayan region, or even some of the birds of the Himalayas, nor do we meet with the gorgeous plumage of those of tropical America, or even the handsome dress worn by so many of the feathered inhabitants of African forests. When the naturalist has made the acquaintance of the Sun-birds, Pittas, and Kingfishers there is not very much left in the way of brilliant plumage to attract him. Notwithstanding, many species are conspicuous for grace and elegance of form combined with an attractive coloration; and if we except the above-mentioned families, the *peculiar* birds of the island number among their ranks some of the most beautiful species inhabiting it.

Before proceeding to the consideration of the ornithological features of the island, it will be well to notice briefly the labours of those naturalists who have heretofore interested themselves in the birds of Ceylon.

Labours of former Writers.—In 1743 George Edwards, Library Keeper to the Royal College of Physicians, published a work entitled 'A Natural History of Uncommon Birds,' and in it figured several species inhabiting India and Ceylon, among which were "The Black Indian Cuckow" (*Eudynamys honorata*), "The small Red-and-green Parrakeet" (*Loriculus indicus*), "The Black-and-white Kingfisher" (*Ceryle rudis*), "The Indian Bee-eater" (*Merops viridis*), "The Black-headed Indian Icterus" (*Oriolus melanocephalus*), "The Crested Red or Russet Butcher-bird" (*Lanius cristatus*), "The Pyed Bird of Paradise" (*Terpsiphone paradisi*), "The Purple Indian Creeper" (*Cinnyris asiaticus*), "The Cowry Grosbeak" (*Munia punctulata*), "The Short-tailed Pye" (*Pitta coronata*), "The Minor" (*Eulabes religiosa*), and "The Emerald Dove" (*Chalcophaps indica*). Of these it will be observed that but one species, the Lorikeet, is peculiar to the island.

During the latter half of the eighteenth century Gideon Loten was nominated Governor of Ceylon by the Dutch, and, happening to be a great lover of birds, collected and employed people to procure specimens of species which attracted his notice; and from his labours we first learn something of the *peculiar* birds of the island. He had drawings prepared of many species, which he lent to an English naturalist named Peter Brown, who published in London, in 1776, a quarto work styled 'Illustrations of Zoology.' His descriptions of the birds he figured were given in French and English, and related to the following species named by him thus:—"The Brown Hawk" (*Astur badius*), "Great Ceylonese Eared Owl" (*Ketupa ceylonensis*), "Red-crowned Barbet" (*Xantholæma rubricapilla*), "Yellow-cheeked Barbet" (*Megalæma flavifrons*), "Ceylon Black-cap" (*Iora typhia*), "Spotted Curucui" (*Cuculus maculatus*), "Red-vented Warbler" (*Pycnonotus hæmorrhous*), "Yellow-breasted Flycatcher" (*Rubigula melanictera*), "The Green Wagtail" (*Budytes viridis*), "The Rail" (*Rallina euryzonoides*), "The Pompadour Pigeon" (*Osmotreron pompadora*). The artist who delineated these species was Mr. Khuleelooddeen. Some of the drawings are fairly accurate; but others are grotesque and unnatural, showing the poor state of perfection to which the illustration of books had up to that time been brought.

We pass on now to a man of a different stamp, Johann Reinhold Forster, who gave Latin names to several of the peculiar Ceylonese forms which now stand, having been published after the Linnean period (1776). This author was likewise indebted to Governor Loten, of whom he speaks in his Introduction that he found a great field for his tastes in the science of natural history, and to assist him in his researches taught several slaves drawing. Forster's work, entitled "Indische Zoologie," was published at Halle, in Germany, in 1781, and is written in German and Latin, purporting to be a "systematic description of rare and unknown Indian animals." The following species are figured and described:—*Circus melanoleucus*, *Strix bakkamuna*, *Trogon fasciatus*, *Cuculus pyrrhocephalus*, *Rallus phœnicurus*, *Tantalus leucocephalus*, *Anser melanonotus*, *Anhinga* (*Plotus*) *melanogaster*, *Anas pœcilorhyncha*, and *Perdix bicalcarata*. Through Loten's instrumentality, therefore, 10 species were described by Forster, in addition to those which Brown figured, and which were afterwards named by Linnæus, Gmelin, and others. Prior to the advent of Templeton and Layard he did more for Ceylon ornithology than any other naturalist. One or two species were made known by Latham in his 'Synopsis,' such as the "Ceylonese Crested

Falcon" (*Spizaetus ceylonensis*) and the "Ceylonese Creeper" (*Cinnyris zeylonicus*); but these were afterwards found to inhabit India; and Levaillant figured two Barbets in his 'Histoire Naturelle des Barbes,' one of which (the Yellow-fronted Barbet) is peculiar to the island.

A long gap now occurs, when little or nothing was done to elucidate the avifauna of the island; and we hear nothing of the birds of Ceylon until Dr. Templeton, R.A., went out there to be stationed. Taking a great interest in the natural history of his temporary home, and at the same time not being a sportsman himself, he depended on his friends for specimens, which he forwarded to Blyth, then curator of the Asiatic Society's Museum, Calcutta, for identification. Fortunately for ornithology one of these friends was Mr. Edgar Leopold Layard, the now well-known ornithologist, and at present Her Majesty's Consul at Noumea. This gentleman, on his arrival in the island, set about collecting for Dr. Templeton, and, in his capacity as an officer in Government service, had ample opportunity for travel and exploration of the jungle.

The same zeal and untiring energy which has throughout life characterized Layard's career was brought to bear upon the study of the Birds of Ceylon; and in a few years his great exertions in collecting bore fruit in a series of papers called "Notes on the Ornithology of Ceylon," published in the 'Annals and Magazine of Natural History,' which demonstrated to the scientific world that Ceylon was far richer in birds than any one had supposed. The account of his important labours is best given in his own words, contained in his kind notice of this work in a late number of 'The Ibis':—"I arrived in Ceylon in March 1846, and for some time, having no employment, amused my leisure in collecting for my more than friend, Dr. Templeton, who had nursed me through a dangerous illness, and in whom I found a congenial spirit. My chief attraction there was the glorious Lepidoptera of the island; but I always carried a light single-barrelled gun in a strap on my back to shoot specimens for the Doctor. He himself, like Dr. Kelaart, never shot, but depended on his friends for specimens. I, of course, soon became interested in the 'ornis;' and on Templeton's leaving at the end of 1847 or beginning of 1848, he begged me to take up his correspondence with the late Edward Blyth, then curator of the R. A. S. Calcutta Museum. He left me his list of the species then known to exist in the island, numbering 183, and Blyth's last letter to answer. From that day almost monthly letters passed between the latter and myself, till I left Ceylon in 1853. The list and the correspondence are still in my possession.

"When I left I had brought up the list to 315; deduct from this the novelties added by Kelaart, and some which I think he has wrongly identified (but which are included in my list in the 'Annals and Magazine of Natural History'), 22 in number, and it leaves me the contributor of 110 species to the Ceylonese ornis, examples of most of which fell to my own gun.

"My collecting-trips never extended to those hill-parts where Dr. Kelaart collected, Nuwara Elliya, &c. I was twice in Kandy, once at 'Carolina,' an estate near Ambegamoa, and once as far as Gillymally, *viâ* Ratnapura."

Besides this, Layard, as he informs me *in epist.*, collected from Colombo to Jaffna, *viâ* Puttalam, Jaffna to Kandy on the Central Road, Colombo to Galle, and round to Hambantota,

Pt. Pedro to Mullaittivu, and thence back to the Central Road. The specimens procured on all these trips, as well as during Layard's residence at Pt. Pedro and other parts of the island, were sent to Blyth for identification, which resulted in the names given by the latter to not a few of the peculiar forms. He published papers from time to time in the 'Journal of the Asiatic Society of Bengal,' and also in 'The Ibis' so late as 1867.

Blyth, however, received specimens from another source, namely, from Dr. Kelaart, a native of Ceylon, and who went out from England in 1849 as Staff-Surgeon to the Forces. This gentleman, though he did not shoot himself, obtained specimens of many of the hill-birds inhabiting the vicinity of Nuwara Elliya, where he resided, and furnished Blyth with skins and notes for some of his papers, one of the most important of which is a "Report on the Mammalia and more remarkable Species of Birds inhabiting Ceylon," published in the 'Journ. Asiat. Soc. Bengal' for 1851. In 1852 Dr. Kelaart published his 'Prodromus Faunæ Zeylanicæ' in Ceylon, chiefly noted for the outline account of the mammals and reptiles of the island, with which he was better acquainted than with its birds. For this work, Layard, as he writes in 'The Ibis' for the current year, supplied him with all his "lists and numerous specimens, not only of birds, but of many mammals and reptiles new to him; and it was arranged that we should bring out a second part of the 'Prodromus' (then in MS. only), which should consist of the Birds, to be written by me." It appears, however, that Kelaart broke faith with him, and issued his 'Prodromus' with the notice of the birds (Part II.) compiled by himself. Thus "left out in the cold," Layard, on his return to England, published the valuable notes referred to above. He also compiled a considerable portion of the notice of the birds of the island contained in Emerson Tennent's 'Natural History of Ceylon,' and furnished the author with voluminous notes, whilst his large collection supplied the materials for the "List of Birds" printed in the work. This was published in 1868, and besides describing the habits and instincts of the mammalia, birds, reptiles, fishes, and insects of the island, includes an interesting monograph of the elephant. During the interval between the last-mentioned date and the year 1854 scarcely any thing was published concerning the ornis of Ceylon, with the exception of a stray paper now and then contributed to the 'Journal of the Asiatic Society,' some of which emanated from the pen of Mr. Hugh Nevill, C.C.S., who recorded the occurrence of the Wood-Snipe in the Part for 1867, which was not published till 1870. At this time Mr. Holdsworth was devoting his attention to the ornithology of the island, and a co-worker, the author, who arrived on the island a year later (Oct. 1868), had likewise commenced to collect vigorously. Mr. Holdsworth, who landed in the island in September 1875, was sent out from England to study the habits of the Pearl-Oyster, and find out the cause of the failure of the Pearl-fisheries, with a view of advising the Government what should be done for their better management. His appointment necessitated his residence, off and on, at Aripu, which is adjacent to the Pearl-banks, and while there he devoted his spare time to a study of the birds in the vicinity of the station. He also collected at Colombo and at Nuwara Eliya during both monsoons. The outcome of his labours during seven years' residence in Ceylon was his "Catalogue of the Birds found in Ceylon," published in

the 'Proceedings of the Zoological Society of London,' 1872, and by far the most complete treatise which had ever been compiled on the avifauna of the island. The author devoted particular attention to the synonymy of the birds, which, up to that time, was in a very confused state; and the result was the working-out of the correct title of each species, which constituted a most valuable addition to the literature of the Ceylonese ornis. The catalogue numbers 326 species.

In this list 24 species were added by the author, which are published under the following titles:—*Hypotriorchis severus*, *Picus æruginosus*, *Pandion haliaëtus*, *Buteo desertorum*, *Huhua pectoralis*, *Brachypternus puncticollis*, *Prionochilus vincens*, *Erythrosterna hyperythra*, *Arrenga blighi*, *Geocichla layardi*, *Zosterops ceylonensis*, *Estrelda amandava*, *Chrysocolaptes festivus*, *Francolinus pictus*, *Chettusia gregaria*, *Terekia cinerea*, *Tringa salina*, *Sterna leucoptera*, *Sterna gracilis*, *Phaethon rubricauda*, *Sula fiber*, *Taccocua leschenaulti*, *Drymoipus jerdoni*, *Gallinago nemoricola*. Of the above, *Zosterops ceylonensis* was not an additional species, but a new name for *Zosterops annulosus* included in Layard's list. The *Butalis muttui* of Layard's list appeared also under another title (*Alseonax terricolor*), though this identification afterwards proved to be erroneous. *Arrenga blighi* was a new species described by Mr. Holdsworth from specimens procured by Mr. Bligh and himself.

A few were omitted, which the author considered had been species wrongly identified, or had been recorded by Kelaart on doubtful evidence; these were—*Ephialtes scops*, *Malacocercus griseus*, *Cisticola homalura*, *Phyllopneuste montanus*, *Phyllornis aurifrons*, *Hetærornis malabaricus*, *H. cristatella*, *Picus macei*, *Alauda malabarica*, *Cuculus bartletti*, *Turtur humilis*, and *Branta rufina*. Among this number *Cuculus bartletti* appears to be the Small Cuckoo (*Cuculus poliocephalus*, p. 231); and *Turtur humilis* seems to have been accidentally omitted, as no mention whatever is made of the species. The *Zosterops annulosus* of Layard's notes, as we have seen, was discriminated as a new species. Figures are given of *Arrenga blighi*, *Zosterops ceylonensis* and *Z. palpebrosus*, *Brachypteryx palliseri*, and *Erythrosterna hyperythra*.

Review of present Work.—The total number of species included in the present work is 371, of which two are introduced birds, viz. *Padda oryzivora* and *Estrelda amandava*. Of the remainder, 18 species, besides the two just mentioned, are treated of in footnote articles, or noticed in the Appendix; of these, *Falco chicquera*, *Accipiter nisus*, *Scops malabaricus* (App.), *Palæornis columboides* (App.), *Lanius lucionensis*, *Siphia nigrorufa*, *Munia rubronigra*, *Fuligula rufina*, *Phalacrocorax fuscicollis*, and *Fregata aquila* are considered as doubtfully occurring. The following, *Cotyle obsoleta*, *Oceanites oceanicus*, *Phaethon indicus*, *Coturnix communis*, are looked upon as doubtfully identified; two species, *Schœnicola platyura* and *Brachypternus intermedius* (red race of *B. puncticollis*), are doubtfully determined; *Alauda parkeri* is perhaps not a good species; whilst one bird (*Stercorarius antarcticus*) may have, perhaps, been *conveyed* to the island in the form of the single example of the species noticed. In addition to the above, *Fuligula ferina*, *Turnix sykesi*, and a species of *Anser* are referred to in "Notes" as likely to occur. The following 24 species have been added by the author to Mr. Holdsworth's

list:—*Baza ceylonensis*, sp. n., *Scops minutus*, sp. n., *Glaucidium radiatum, Cuculus poliocephalus, Brachypternus intermedius,* ? *Schœnicola platyura, Locustella certhiola,* ? *Cotyle obsoleta, Prinia hodgsoni, Turtur tranquebarica, Coturnix communis, Machetes pugnax, Calidris arenaria, Ægialitis geoffroyi, Æ. jerdoni, Glareola orientalis, G. lactea, Tringa temmincki, Ciconia alba, Tadorna casarca, Sterna saundersi, Sterna fuliginosa, Anous stolidus, Sula cyanops, Phaethon flavirostris.* Four species have been renamed—*Spizaetus nipalensis, Pyctorhis sinensis, Prinia socialis,* and *Acridotheres tristis,* which appear in this work as *Spizaetus kelaarti, Pyctorhis nasalis, Prinia brevicauda* (App.), and *Acridotheres melanosternus.*

In the subjoined Table will be found all the species which are recognized in the work as peculiar to the island; among them are included two birds about which there are doubts as to their not being found in India. These are *Drymœca insularis* and *Brachypternus intermedius,* the former of which may perhaps be the same as a South-Indian Wren-Warbler (*D. inornatus*). The birds here tabulated are all figured, with the exception of *Prinia brevicauda* and *Turdus kinnisi,* the reasons for the omission of which will be found in the Appendices.

Table of Birds peculiar to Ceylon.

Families.	Number of species.	Name.	Hill-district (under 5000 feet).	Low country.	Nuwara-Elliya plateau and over 5000 feet.
Falconidæ	2	Spizaetus kelaarti	*	..	*
		Spizaetus ceylonensis	*	*	*
Bubonidæ	3	Athene castanonota	*	*	*
		Scops minutus	*		
		Phodilus assimilis	*	? *	
Psittacidæ	1	Palæornis calthropæ	*	‖	
Trichoglossidæ	1	Loriculus indicus	*	*	
Picidæ	3	Chrysocolaptes stricklandi	*	*	*
		Brachypternus ceylonus	*	*	
		Brachypternus intermedius(App.II.)	..	*	
Capitonidæ	3	Megalæma zeylanica	*	*	
		Megalæma flavifrons	*	*	
		Xantholæma rubricapilla	*	*	
Cuculidæ	2	Centropus chlororhynchus	..	*	
		Phœnicophaës pyrrhocephalus	..	*	
Dicruridæ	2	Buchanga leucopygialis	*	*	
		Dissemurus lophorhinus	†	*	
Corvidæ	1	Cissa ornata	*	¶	*
Muscicapidæ	3	Stoparola sordida	*		
		Alseonax muttui	..	*	
		Hypothymis ceylonensis	*	*	

TABLE OF BIRDS PECULIAR TO CEYLON (*continued*).

Families.	Number of species.	Name.	Hill-district (under 5000 feet).	Low country.	Nuwara-Elliya plateau and over 5000 feet.
Turdidæ	4	Myiophoneus blighi	*	..	*
		Turdus kinnisi (App. II.)	*	..	*
		Turdus spiloptera	*	*	*
		Oreocincla imbricata	*	..	*
Brachypodidæ	2	Rubigula melanictera	*	*	†
		Kelaartia penicillata	*	..	*
Timaliidæ	10	Malacocercus rufescens	*	*	*
		Garrulax cinereifrons	*	‡	
		Pomatorhinus melanurus	*	*	*
		Alcippe nigrifrons	*	*	*
		Pellorneum fuscicapillum	*	*	†
		Pyctorhis nasalis	*	*	
		Prinia brevicauda	*	*	
		Elaphrornis palliseri	†	..	*
		Drymœca valida	*	*	
		? Drymœca insularis	..	*	
Dicæidæ	2	Pachyglossa vincens	*	*	
		Zosterops ceylonensis	*	..	*
Hirundinidæ	1	Hirundo hyperythra	*	*	§
Ploceidæ	1	Munia kelaarti	*	..	*
Sternidæ	3	Acridotheres melanosternus	..	*	
		Eulabes ptilogenys	*	‖	
		Sturnornis senex	*	¶	? *
Columbidæ	1	Palumbus torringtoniæ	*	..	*
Phasianidæ	2	Gallus lafayettii	*	*	*
		Galloperdix bicalcarata	*	*	*

† Not common. ‡ Certain forests of Western Province in N.E. monsoon.
§ Occasional. ‖ Spreading into the forests at the base of the hills, particularly in the W. Province.
¶ In the forests of the Passedun Korale, down to 600 feet near Moropitiya.

It will be seen that this Table comprises 47 species. One *peculiar genus* (*Elaphrornis*) inhabits the island, its nearest ally being the Malayan and Himalayan *Brachypteryx*; and a subgenus (*Sturnornis*) is likewise recognized.

Affinities of the Ceylonese Avifauna.—We now come to the important point of the relationship of the Ceylonese ornis to that of adjacent regions; and this, as might be expected from the geographical position of the island and its separation from the mainland merely by a

shallow strait, is closer to that of South India than to the avifauna of any other part of the peninsula. Wallace, in his great work on the Distribution of Animals, considers the island of Ceylon and the entire south of India as far north as the Deccan as forming a subdivision of the great "Oriental Region." It is, however, in the hills of the two districts, which possess the important element of a similar rainfall, where we find the nearest affinities both as regards birds and mammals; and this is exemplified by the fact of some of the members of the Brachypodidæ and Turdidæ (families well represented in both districts) being the same in the Nilghiris and the mountains of Ceylon, while many of the Timaliidæ and Turdidæ in one region have near allies in the other. For example, *Malacocercus* (*Layardia*) *rufescens*, *Pomatorhinus melanurus*, *Alcippe nigrifrons*, *Garrulax cinereifrons*, *Myiophoneus blighi*, *Oreocincla imbricata*, *Turdus kinnisi*, and *Palumbus torringtoniæ* in Ceylon are respectively represented in the hills of South India by *Layardia subrufa*, *Pomatorhinus horsfieldi*, *Alcippe atriceps*, *Garrulax delesserti*, *Myiophoneus horsfieldi*, *Oreocincla nilgherriensis*, *Turdus simillima*, and *Palumbus elphinstonii*.

But though this strong similarity in the avifauna of the mountains in question, as well as their geological characters, indicate a contemporaneous upheaval and enrichment with animal life of their surfaces, a similar connexion is found between the northern parts of the island and the low country of the Carnatic. Here, again, we have in the fossiliferous limestones of the two regions an undoubted connexion, and also an affinity in their avifauna, which differs totally from the mountain-districts on either side of the straits. The northern parts of Ceylon, as well as the south-eastern, both of which I shall speak of in my remarks on the geographical features of the island, may be considered to constitute an Indo-Ceylonese subregion, and are inhabited by the same species as the south-east coast-districts of the peninsula. *Brachypternus puncticollis*, *Anthracoceros coronatus*, *Malacocercus striatus*, *Pycnonotus hæmorrhous*, *Merops viridis*, *Pyrrhulauda grisea*, *Mirafra affinis*, *Turtur risorius*, *Buchanga atra*, and perhaps *Cursorius coromandelicus* are species characteristic of the north of Ceylon and of Ramisserum Island and the plains of Tanjore, but which are not inhabitants of the damp Malabar district. On the other hand it is noteworthy that *Gallus sonnerati* and the Lesser Florrikin (*Sypheotides aurita*), common in the Carnatic, have not yet been detected in North Ceylon. It is by way of the low-lying country of the Carnatic (the fauna of which, it may be remarked in passing, is allied to that of Central India) that the cool-season migrants enter the island of Ceylon, leaving numbers of their fellows in Southern India; and this forms an additional ornithological bond between the two districts. Some of these migrants come from the regions at the foot of the Himalayas, and tend to the supposition that there is a Himalayan element in the avifauna of Ceylon; but this is but very slight, if, indeed, it should at all be recognized, for migratory species, such as *Scolopax rusticula* and *Gallinago nemoricola* (which only inhabit the upper ranges and the high mountains of Southern India, and whose *locale* depends solely on climate), cannot be taken into consideration. One genus (*Pachyglossa*) certainly does constitute a bond of affinity. The distinctness of the avifauna of the Southern-Indian and Ceylonese mountains from that of the Himalayas may be shown by the fact that most of the Himalayan typical Timaline genera, *Suthora*, *Stachyris*, *Trochalopteron*,

Actinodura, are wholly absent from Ceylon, and but poorly represented in the hills of South India, there being only three species of the numerous genus *Trochalopteron* in the Nilghiris and Palani hills and not any of the others. Again, there is only one species of *Garrulax* in South India and one in Ceylon. Of the widely spread genus *Pomatorhinus*, found in the Himalayas, Burmah, and Java, there is only one species in each of the southern hill-regions in question. The genus *Alcippe* is about equally represented in both regions. These data show that though there is a connexion between the ornis of the Himalayas and that of Ceylon it is but slight, and only what one would expect in mountain-districts of adjacent ornithological regions. It is noteworthy that the Liotrichidæ, or Hill-Tits (one of the three peculiar families of the Oriental Region, and which are abundant in the Himalayas), are absent from Ceylon.

Certain Indian families are entirely absent from Ceylon, either as residents or migrants; they are the Eurylaimidæ (Broadbills)—a Himalayan and Malayan form,—the Pteroclidæ (Sand-Grouse), the Otididæ (Bustards), Gruidæ (Cranes), and Mergidæ (Mergansers). Among these families it is remarkable that some member of the Gruidæ has not yet been found in the cool season in North Ceylon; for, though the country is not thoroughly suited to their habits, the members of this family being migratory (and one of them, the Demoiselle Crane, extending to South India), it is singular that they do not extend their migration a little further south and reach the shores of Ceylon. I have heard a vague rumour of a Crane being seen near Mullaittivu; and it is not wholly improbable that the above-mentioned species (*Anthropoides virgo*) will some day be added to the occasional migrants during the N.E. monsoon. Another family, Vulturidæ, has a place in the Ceylonese avifauna, owing to a straggler having recently appeared in the island. Here, again, is an instance of species which, one would think, ought to occur as visitants in the N.E. monsoon; for I am informed that Vultures are not unfrequently seen in the Tanjore district; and *Gyps indicus* breeds in the Nilghiris.

Besides the widely distributed Grallatorial and Natatorial forms common to both India and Ceylon, certain Indian genera of western distribution are represented in the island. They are *Cuculus*, *Ceryle*, *Halcyon*, *Cypselus*, *Caprimulgus*, *Corone*, *Lanius*, *Turdus*, *Phylloscopus*, *Cinnyris*, *Hirundo*, *Motacilla*, *Corydalla*, *Turtur*, *Francolinus*. Of these the Cuckoos are remarkably numerous.

If we turn now towards the Malayan region we find, in spite of its more remote geographical position, quite as close an affinity as with the Himalayas—which may perhaps be accounted for on the theory held by some that there was at one time a connexion between the two regions. It may, however, be remarked, in passing, that if this did occur it must have been, in all probability, by way of the Andamans and Malacca, as we find the 15,000 feet contour of ocean-depth passes up near the east coast of the island into the Bay of Bengal to lat. 10° N. This Malayan affinity is shown in the existence in Ceylon of a Malayan form, *Phœnicophaës*, and a member of a typical Sunda-Island genus, *Myiophoneus*. It is also worthy of note that the island is visited by a Malaccan emigrant, *Gorsachius*, which has rarely been met with in India. This is remarkable, as, in all probability, before the submergence took place which altered the Malayan

region, the hills of South India were just as much connected with Malacca as those of Ceylon. A closely allied Swallow to our "peculiar" *Hirundo hyperythra* is found in Malacca; and Malayan genera of Pigeons (*Carpophaga*, *Osmotreron*, and *Chalcophaps*) are also found in Ceylon, and perhaps to a greater extent, when we look at its small geographical area, than in India. Certain Australian and Malayan birds, such as *Haliaetus leucogaster*, *Coturnix chinensis* (found also in China), *Mycteria australis*, extend into Ceylon, not to mention the Waders (*Limicolæ*), which range from Asia thence to the Australian continent, taking in Ceylon in their path.

The island, however, is not dependent on these latter for its migratorial Waders, in which, as also in some water-birds (Anatidæ), it is very rich. It forms, in fact, the southernmost Asiatic limit of the flight of many European and Asiatic Grallatorial and Natatorial forms; and hence the large numbers of these birds which are found in the cool season along its shores. Of these the following species are noteworthy:—*Scolopax rusticula*, *Gallinago nemoricola*, *Machetes pugnax*, *Tringa minuta*, *Totanus ochropus*, *Totanus fuscus*, *Tringa minuta*, *Limosa ægocephala*, *Himantopus candidus*, *Recurvirostra avocetta*, *Œdienemus scolopax*, *Hæmatopus ostralegus*, *Anas acuta*, *Anas circia*, *Anas crecca*, and *Phœnicopterus roseus*.

Geographical Features and Inland Distribution.—Having now considered the important question of the affinities of the Ceylonese avifauna it is necessary to notice the geographical features of the island as bearing upon the inland distribution of the birds inhabiting it. Ceylon is an island of about 270 miles in length and 138 in breadth, lying between lat. 5° 50′ and 9° 50′ N., and between long. 79° 40′ and 61° 50′ E.; it is separated from the mainland of India by a shallow strait 35 miles wide, which is traversed by a chain of islands, between which lies a long sandy shoal called Adam's Bridge, which is alternately raised and lowered on the north and south by the action of N.E. and S.W. monsoons. For ornithological purposes the island may be divided into four regions or districts—the dry forests of the entire north and south-east, the arid maritime belts of the north-west and south-east coasts, the damp Western-Province region, and the hill-zones of the Central and Southern Provinces. The northern part of the island consists of a vast plain covered with forest, except near the sea, where, particularly on the north-west coast, there are open tracts studded with low thorny jungle. This region is called in the present work the "northern forest-tract," and is here and there studded with very rocky abrupt hills, rising suddenly out of the forest-clad plain. Sigiri, Rittagalla, and Mahintale rock are some of the most notable among these acclivities. This region, which lies to the north of the high land intercepting the moisture brought up from the ocean by the S.W. and N.E. monsoons, is alternately swept by a dry westerly and easterly wind, and is covered with tolerably luxuriant forest and wild secondary jungle, inhabited chiefly by members of those Indian families which are most strongly represented in the island, the Flycatchers, Drongos, Barbets, Bulbuls, Babblers (Timaliidæ), and Cuckoos, but also contains many of the forest-loving "peculiar" forms, which have their stronghold further south. The northern forest-tract likewise is the home of many of the larger

Water-birds and "Waders" which affect the numerous tanks* in the heart of the jungle. The most luxuriant vegetation in this part of the island is to be found on the banks of the rivers, where the Koombook (*Terminalia glabra*) is one of the most characteristic trees. In the drier parts the forest is sprinkled plentifully with the iron-wood (*Mimusops indica*), the fruit of which is the favourite food of many birds. The open scrubby belt of land bordering the N.W. coast, as also the island of Manaar and parts of the peninsula of Jaffna, are characterized by a very different flora. Here almost every tree is of a thorny nature, and the low and almost impenetrable masses of brushwood are filled with Euphorbia-trees (*Euphorbia antiquorum*), which is the characteristic plant of the district. This region is the home of plain-loving birds, such as *Pyrrhulauda grisea*, *Merops viridis*, *Munia malabarica*, and is the almost exclusive habitat of *Buchanga atra*, *Lanius caniceps*, *Turtur risorius*, *Ortygornis pondiceriana*, and *Cursorius coromandelicus*, which appear to have extended their range from the Carnatic hither and not passed beyond the forests which hem in the district. Here, too, is the great haunt of the migratory Waders, which swarm on the muddy flats between Jaffna and Manaar, and also congregate round the salt lagoons of the N.E. coast. These latter are surrounded with heavy jungle, inhabited by the same birds as further inland, but which stands back at some distance from their grass-begirt shores.

Southward of the region just considered we have on the west coast the damp, luxuriant, typically Ceylonese region, cultivated with rice in some parts and in others clothed with tall forest, of which the characteristic trees are the gigantic Hora (*Dipterocarpus zeylonensis*), the Doon (*Doona affinis* and *Doona congestiflora*), the stately Keena (*Calycophyllum tomentosum*), and the lofty Dawata (*Carallia integerrima*). This tract, which comprises the Western Province and "South-western Hill-district," is intersected with ranges and groups of hills heavily timbered in some parts

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* Many of these large irrigation-works claim a place among the most gigantic monuments of ancient enterprise and labour; they literally astonish the traveller and fill his mind with wonder as he stands on the vast bunds and looks down on the wild and lonely scene, pondering on the means and appliances which the engineers of those distant times must have used to get the great stones in their places. Whole valleys have been dammed up, and sometimes the strong floods of three rivers thrown back and spread out into a great lake, the waters of which must have irrigated thousands of square miles. The bund of the great Padewiya tank extends for 11 miles across a valley, and in olden times, before this enormous embankment was broken down by the rush of mighty floods, the water was, as Emerson Tennent tells us, thrown back for 15 miles along the valley. I regret to say I never visited this tank; but I have seen other bunds of great size, of which perhaps that which holds back the waters of Kanthelai tank is the finest. This tank, which has been lately restored, was built by King Maha Sin, A.D. 275; and the following details kindly furnished me by Mr. E. Scott Barber, C.E., who repaired the bund, may not be uninteresting to my readers:—"When up to 'spill-level' (22 feet), the tank contains 3580 acres, and is 17 miles round. The bund is 60 feet high and 290 feet in width at the bottom; it is 6800 feet in length, and contains 19,121,296 cubic yards of material. It is 'pitched' with large boulders from bottom to 60 feet up the slope and from 3 to 4 courses deep. The outlet was by two culverts 4 feet by 2 feet, situated at either end of the bund; the stones forming them average $1\frac{1}{2}$ to 2 tons in weight, and are 'tongued' together in the centre." The top of this mighty embankment was about 60 yards wide and covered with jungle and large trees. As it was, it gave one the impression, when walking along it, of standing on a natural ridge or long low hill!

and covered with bamboo-cheena in others; the valleys, constantly rained on during the south-west monsoon, and likewise receiving a heavy downfall in the north-east monsoon, are the dampest spots in the island, and harbour numbers of Timaliidæ (*Malacocercus rufescens, Garrulax cinereifrons, Alcippe nigrifrons, Pellorneum fuscicapillum*), also Brachypodidæ (*Hypsipetes ganeesa, Criniger ictericus, Rubigula melanictera*). The cultivated districts are conspicuous for the numbers of the common Bulbuls, Barbets, Doves (*Turtur suratensis*), smaller Timaliidæ (*Cisticola, Prinia, Drymœca*, &c.), as well as some numbers of the Heron family, which are seen about the paddy-fields. A considerable portion of the uncultivated soil in the Western Province and also in the lower hills is overgrown with a dense bramble (*Lantana mixta*), popularly known as "Lady Horton's wood," and which was introduced (unfortunately) into the island about the year 1830. It thrives on gravelly soil, and especially on land which has once been cultivated, sometimes clothing more than an acre without a single break. The fruit of this pest is eagerly sought after by many birds, particularly Bulbuls (*Rubigula, Pycnonotus, Ixos*); and to this fact the wonderful manner in which it has been propagated is due. The damp, heavy forests of the Adam's-Peak range descend continuously into the low country of Saffragam, and through them several true hill species (*Eulabes ptilogenys, Palæornis calthropæ, Garrulax cinereifrons*) range to a lower level than anywhere else, being quite common in portions of the Kuruwite and Three Korales.

We now come to the consideration of the fourth ornithological district, the lofty hills of the Southern Province, rising up on the north of the valley of Saffragam, of which Ratnapura is the chief town. The first-named region is entirely occupied by a group of high mountains and elevated valleys, forming a perfect mountain-zone, inside of the base of which there is scarcely any land of less elevation than 1500 or 1700 feet. This lofty district culminates in the high Pedrotallagala range (8200 feet), just on the north of the plain of Nuwara Eliya, from which extends an elevated plateau, intersected by forest-clad ridges, and dotted here and there with the curious natural fields called patnas, for some 20 miles south to the Horton plains (7000 feet), whence the lofty Haputale range stretches to the east and the Adam's-Peak range round to the west as far north as the Four Korales, the slopes of both dropping at once into the low country. The coffee-districts of Dimbula and Dickoya are enclosed by the latter on the east of the Nuwara-Eliya plateau, each with its dividing range; while the Uva patna-basin (a curious tract of grass-covered or patna-hills) forms its eastern flank, and slopes out into the Bintenne country through the valley of Badulla, being bounded on the extreme east by the lofty ridges of Madulsima. On the north of the Pedro mountain high ranges jut out towards the upland valley of Dumbara, beyond which the Knuckles and Ambokka ranges, running on each side to the north-west and north respectively, complete the Kandyan mountain-system. The southern hill-ranges bound the south side of Saffragam, and are comprised of the Kukkul, Morowak, and Kolonna Korales, the highest point being Gongalla, a little over 4400 feet in altitude. Of late years the forest has been felled for the planting of coffee, as in the Central Province; but there are still large tracts of forest in the Kukkul Korale in which Central-Province birds (*Cissa ornata, Eulabes ptilogenys, Sturnornis senex*,

Palæornis calthropæ, *Zosterops ceylonensis*, *Culicicapa ceylonensis*) abound, and in which both *Gallus lafayettii* and *Galloperdix bicalcarata* are plentiful. The northern portion of this korale, lying between the Karawita hills and the hilly forests of the Passedun Korale, consists partly of semicultivated land and partly of a curious and little-known tract of open grassy hills with wood-dotted dingles, resembling the patnas of the Kandyan country, and on the open parts of which Grass-Warblers, Wren-Warblers, and Munias are common, while Babblers (*Pomatorhinus*) are found in the groves; but otherwise an absence of bird-life is decidedly noticeable.

It is in the coffee-districts and valleys lying beneath the estates which are dotted with patna-grasses, particularly "Maana-grass" (*Andropogon martini*), and patched here and there with groves of luxuriant trees lining the courses of the streams, where the hill-species, both "peculiar" and Indian, intermingled with not a few low-country forms, abound; but it is also in these spots where the original ornithological features of the country are being gradually changed by the disappearance before the woodman's axe of such a vast area of forest, and species such as *Palumbus torringtoniæ*, *Merula kinnisi*, *Eulabes ptilogenys*, *Stoparola sordida*, and *Culicicapa ceylonensis* (true hill-species) are being driven into the upper forests, or are locating themselves to a considerable extent about the open estates where once their forest-home stood.

In the upper forests and in the Nuwara-Eliya plateau we lose the stately trees of the genera *Doona*, *Dipterocarpus*, &c., and find stunted, though thick-trunked, arboreal forms, for the most part profusely clothed with handsome mosses; and these woods, with their circumscribed patnas, are the favourite haunts of the peculiar birds enumerated in my table, as well as many Indian species, both permanent and migratory. Of the former may be mentioned *Merula kinnisi*, *Culicicapa ceylonensis*, *Parus atriceps*, *Cisticola schœnicola*, *Pericrocotus flammeus*, *Pericrocotus peregrinus*, *Hypsipetes ganeesa*, *Pratincola bicolor*, *Orthotomus sutorius*, *Corydalla rufula*; of the latter, *Turdus wardi*, *Erythrosterna hyperythra*, *Larvivora brunnea*, *Hierococcyx varius*, *Phylloscopus nitidus*, *Phylloscopus magnirostris* are noticeable.

The eastern subdivision of Southern Ceylon, which is shut off from the influence of the south-west monsoon by the eastern slopes of the Kolonna and Morowak-Korale mountains and their spurs, which run south towards Matara, presents one of the most remarkable instances of a sudden change in physical aspect and floral character that can, perhaps, anywhere be met with in such a small island. Possessing a totally different climate, and consequently a distinct flora, the avifauna of this region has little relation to that of the damp south-western division. The birds of the vast forest which stretches southwards from the Haputale mountains to the confines of the scrubby maritime district are the same as those of the northern forests; and the ornis of the coast-region is precisely the same as that of the north-west coast, except that it includes several species, such as *Prinia hodgsoni*, *Taccocua leschenaulti*, and *Pyctorhis nasalis*, which seem to have their head-quarters here, and are not found (in such abundance, at any rate) in that part. Characteristic species of the two regions are *Xantholæma hæmacephala*, *Pyrrhulauda grisea*, *Merops viridis*, *Picus mahrattensis*, *Upupa ceylonensis*, and *Cittocincla macrura*, none of which, with the exception of the latter bird, are found in the adjoining damp district. The numerous shallow

salt lagoons and leways are the resort of Waders, Terns, Herons, Flamingoes, and Water-birds, all of which are characteristic of the north-west of the island. The north-eastern part of the subdivision in question is called the Park country, the borders only of which, I much regret to say, are known to me. This tract consists of open glades and small plains covered with long grass and surrounded by heavy jungle, in which there are numbers of birds, the prevalence of Woodpeckers being noticeable. As regards the open country, it is not unlikely that some new Timaline species may be found in it.

Lastly, with regard to the great families of Scolopacidæ and Charadriidæ, which form such a large proportion of the Ceylonese ornis, and which migrate to the island in vast numbers at the commencement (October and November) of the cool season, as will be seen on a perusal of this work, their great haunts are the lagoons, tidal flats, marshes, and tanks near the coast along the northern shores of both sides of the island. On the west coast these cease to the southward of Negombo, and the sea-board is only intersected with deep mangrove-lined lagoons and lakes, which are quite destitute of "Wader"-life, save that of one or two species, as the ubiquitous *Tringoides hypoleucos* and the very abundant *Totanus glareola*. The entire east coast, however, is more or less inhabited by Sandpipers, Stints, Shore-Plovers, and other members of these families. From the Virgel down to Batticaloa the sea-board is not so favourably suited to their habits as further south, where they again become very abundant, and occupy the coast-line, with its numerous estuaries, leways, and lagoons, down to Hatagala. Nowhere, however, do these interesting birds muster in such force as from the Jaffna peninsula, with its inland salt lagoon and large salt lake, down the west coast to the immense tidal flats at the embouchure of the Manaar channel. The entire coast of this region is shallow, the tide receding some distance, and leaving exposed an oozy shore, covered in places with green weed. On these flats myriads of small Waders congregate, and species (such as the Turnstone and that anomalous bird the Crab-Plover) which are not plentiful on the east coast are here found in abundance. In this district are of course included the islands of Palk's Straits, on which these birds are likewise equally abundant.

Monsoons and Seasons.—There are, roughly speaking, two seasons in Ceylon, which are ushered in by the advent of two monsoons, the south-west and north-east. The former commences to blow in April, after the termination of the hottest time of the year, the sultry weather of March. For about a fortnight violent squalls, accompanied by downpours of rain, drive in from the sea on the west coast; and along the western slopes of the mountain-ranges, where the moisture resulting from this wind collects, the rain is just as heavy and more continuous. This weather, which is called the "little monsoon," is, though unpleasant, preferable to that which preceded, when there was an absence of wind and the nights were very sultry. It is the signal for the commencement of the spring migration. Insessorial birds (Warblers &c.) immediately move northwards, and the Waders, which throng the salt lagoons and estuaries on the northern and eastern coasts, commence their long flight towards northern regions. After the cessation of the little monsoon there is a lull, when the weather is again unpleasantly hot and "steamy," until

the end of May, when the south-west wind again blows with greater violence than before, for in some years the "little monsoon" is not by any means strong. The rain at this period is also much more continuous, and sometimes very heavy downfalls are experienced, as in 1876, when 11 inches fell at Colombo in twenty-four hours. At this time of the year perfectly different weather is experienced on the east coast, when the same south-west wind, deprived of its moisture by its passage over great tracts of forest, has become intensely dry and almost warm. After the burst of the monsoon is over the wind gradually lessens throughout the months of July, August, September, and beginning of October, when the weather again becomes sultry. The great autumn migration is now setting in: myriads of Sandpipers, Stints, and shore-birds in general are now travelling southward from Northern Asia, and some species, as the Pintailed Snipe and the Golden Plover, arrive on the north coast, and even reach the south-western district (Galle) as early as the middle of September; at the same time Warblers and Wagtails arrive in the island and rapidly spread over the country.

About the middle of October, and sometimes as early as the first week in that month, the first signs of the N.E. monsoon may be looked for on the east coast. Heavy thunderstorms coming from the land every afternoon betoken the breaking up of the S.W. monsoon; they continue for about a fortnight, and then the wind, with rain, sets in from the north-east; at the same time on the west coast heavy thunderstorms are experienced every evening, which, in the same manner as those which preceded them on the east coast, take place later each consecutive evening until they cease. During this time migrants from India continue to arrive, and a local movement of birds towards the west coast takes place. The north-east wind, which is not so strong as the south-west, reaches the west coast only in the form of a land-breeze at night, which is scarcely felt until about Christmas. In the meantime, at the end of November, a strong northerly breeze sets in down the west coast; this is locally styled the "long-shore wind," and is mainly conducive in adding to the ranks of migrants of all classes, but particularly to those of the Grallatorial order. Snipe now come in great numbers, and by the middle of December large bags may be made in almost any good district.

Internal Migrations.—It is natural that the prevalence of two winds blowing at different seasons from opposite quarters across the island should cause a movement of species inhabiting the coast districts on each side of it. This is most observable on the coast of the Western Province, south of Negombo, as here the wind is damp, and, as we have just seen, accompanied by heavy rains, which induce certain species to leave the sea-board and retire inland in order to obtain shelter from the force of the monsoon. It would appear to any one studying the avifauna of a coast-district, like that of Colombo for example, that all these birds had left that side of the island; but this is not the case, as they are mostly to be found after the rains of June in the sheltered districts of the interior, not far from the coast. On the other hand, however, various species which are not resident on the west coast visit it when the S.W. monsoon has died away and the N.E. monsoon has commenced to blow on the east coast, tending to carry them towards

the south-west. Instances of such birds are to be found in the Paradise Flycatcher (*Terpsiphone paradisi*) and the Indian Sky-Lark (*Alauda gulgula*), which latter bird is found during the south-west monsoon in numbers at the tank-meadows in the northern forests, while the former (in the red stage) inhabits both the northern and south-eastern forest-tracts. Species that move away from the *immediate* western sea-board are *Dendrochelidon coronata*, *Eudynamys honorata*, *Thamnobia fulicata*, *Tephrodornis pondicerianus*, and *Parus cinereus*; but a few miles inland, in sheltered spots, these birds may be found all the year through, except perhaps the latter, which must be classed as an uncertain N.E. monsoon visitant to the maritime districts of the Western Province.

In the mountains the movements of the hill species are very noticeable in those districts west of Nuwara Eliya which are exposed to the violent winds and rain which accompany the incoming of the monsoon in May. The Hill-Myna (*Eulabes ptilogenys*), the Blue Tit (*Parus atriceps*), the handsome Torrington Wood-Pigeon (*Palumbus torringtoniæ*), the large Bulbul (*Hypsipetes ganeesa*), the Orange Minivet (*Pericrocotus flammeus*), the Jay (*Cissa ornata*), the Hill-Barbet (*Megalæma flavifrons*), the Jungle-fowl (*Gallus lafayettii*), and the Spur-fowl (*Galloperdix bicalcarata*) are among the more prominent species which appear in the upper ranges (from 5000 to 8000 feet) as soon as the calm weather of the N.E. monsoon has set in in November.

At this season of the year also low-country birds, which, as a rule, only range into the hill-zones to an inconsiderable elevation, ascend to the upper hills. *Artamus fuscus*, *Oriolus melanocephalus*, *Upupa ceylonensis*, *Pycnonotus hæmorrhous*, *Layardia rufescens*, *Terpsiphone paradisi*, and *Hypothymis ceylonensis* are species which either occasionally ascend to altitudes above 5000 feet, or are found yearly in the upper zone during the N.E. monsoon.

True Migrants.—The arrival of the migratory species, which takes place, as already mentioned, at the termination of the S.W. monsoon, greatly adds to the avifauna of the island. The Insessorial migrants consist chiefly of Muscicapidæ, Laniidæ, Motacillidæ, and Sylviidæ, while the Grallatorial are made up of Scolopacidæ and Charadriidæ. The members of the first-mentioned order are wholly migratory; but certain species of the two latter remain to some extent as non-breeding loiterers throughout the year. The following is a table of migrants:—

Accipitres.	Picariæ.	Insessores.
Baza lophotes.	*Cuculus canorus.	Oriolus indicus.
Falco peregrinus.	Cuculus micropterus.	Lanius cristatus.
Cerchneis amurensis.	Cuculus poliocephalus.	Buchanga longicaudata.
Circus æruginosus.	Cuculus passerinus.	Alseonax latirostris.
Circus cineraceus.	*Cuculus maculatus.	†Siphia rubeculoides.
Circus melanoleucus.	Hierococcyx varius.	Muscicapa hyperythra.
	Coccystes coromandus.	*Cyanecula suecica.
	Merops philippinus.	Larvivora brunnea.

Turdus wardi.
Geocichla citrina.
*Monticola cyana.
*Sylvia affinis.
Acrocephalus dumetorum.
Locustella certhiola.
Phylloscopus nitidus.
Phylloscopus magnirostris.
Phylloscopus viridanus.
Hirundo rustica.
*Hirundo erythropygia.
*Motacilla maderaspatensis.
Motacilla melanope.
Budytes viridis.
Corydalla richardi.
Corydalla striolata.
†Pitta coronata.

COLUMBÆ.

*Turtur pulchratus.

GRALLÆ.

*Porzana bailloni.
Porzana fusca.
Rallina euryzonoides.
? Hypotænidia striata.
*Rallus indicus.
*Scolopax rusticula.
*Gallinago scolopacina.
Gallinago stenura.
*Gallinago gallinula.
‡Limosa ægocephala.
‡Terekia cinerea.
†Totanus glottis.
†Totanus stagnatilis.
‡Totanus fuscus.
Totanus calidris.
Totanus glareola.
Totanus ochropus.
†Tringoides hypoleucus.
*Machetes pugnax.
†Tringa subarquata.
†Tringa minuta.
†Tringa subminuta.
*Tringa temmincki.
‡Limicola platyrhyncha.
*Calidris arenaria.
§Strepsilas interpres.
Numenius lineatus.
Numenius phæopus.
‡Recurvirostra avocetta.
Squatarola helvetica.
Charadrius fulvus.
†Ægialitis geoffroyi.
†Ægialitis mongolica.
*Chettusia gregaria.
Hæmatopus ostralegus.
†Sterna caspia.
Larus brunneicephalus.
Tadorna casarca.
Anas acuta.
Anas circia.
Anas crecca.
Spatula clypeata.
?§ Phœnicopterus roseus.
*Ardea goliath.
Gorsachius melanolophus.

* Rare stragglers to the island *in N.E. monsoon,* or irregular migrants in small numbers.
† Migratory for the most part, non-breeding birds remaining throughout the year.
‡ Possibly a regular migrant in small numbers.
§ Rarely a loiterer in Ceylon in S.W. monsoon.

In this list the families Cuculidæ and Sylviidæ muster strongest among land-birds, but do not, it will be observed, furnish as many representatives as the Grallæ (Waders). Among the latter it is noteworthy how many species "loiter" or remain behind in the breeding-season. A knowledge of this fact is all the more interesting, as, until very recently, it was not known that members of the Gralline order, such as *Totanus*, *Tringa*, and *Ægialitis*, ever remained in the tropics throughout the year; now, however, the researches of Mr. Hume in the Andamans, and of myself in Ceylon, have fully proved this to be the case. Stragglers to Ceylon at uncertain times of the year have not been included in the list, as they cannot be looked upon in any way as migrants. Among these may be mentioned *Neophron ginginianus*, *Nisaetus pennatus*, *N. bonelli*, *Baza ceylonensis*, *Buteo desertorum*, *Pastor roseus*, *Alsocomus puniceus*, *Sterna dougalli*, *Anous stolidus*, *Sula leucogastra*, *S. cyanops*, *Stercorarius antarcticus*, *Phaethon flavirostris*, *P. indicus*, and *Fregata minor*. Of these, *Pastor roseus* and *Sterna dougalli* are the only species which, when they do visit the island, appear in numbers.

Breeding-season.—The majority of Ceylon birds breed during the first half of the year, the exact times varying according to locality and climate. In the Western Province the height of the breeding-season is, as in India, during the rains of April, May, and June. At this time the

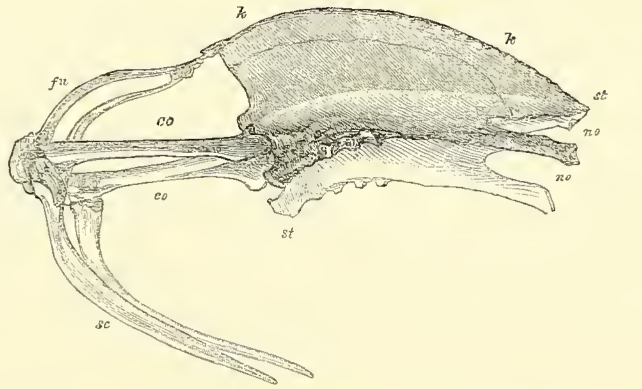
jungles teem with insect-life, and all forest-birds are busy rearing their young. In very moist districts, such as Ratnapura and the Passedun Korale, eggs may be found in August and even September. Among early breeders in the Western Province may be cited the Barbets and Woodpeckers. On the eastern side of the island many birds commence to breed in November and December, while the heavy rains are falling; but the season continues, nevertheless, throughout the first three or four months of the year, and many birds may be found nesting, as on the western side, in May and June. In the hills, and more particularly in the upper ranges, where the nights are cold and frosty in January and February, the nesting-season commences at the end of March or beginning of April, and continues until June and July, corresponding in this respect with the breeding-time in temperate climates. In the north of Ceylon the larger Waders (Ardeidæ), and the Water-birds that breed with them, commence to nest in November; but on the south-east coast the season is later, the Heronries not being resorted to as a rule, I think, before January.

Remarks on the plan of the Work. 1st. *Classification.*—The classification followed in this work is totally different from that used by Jerdon, principally taken from Gray, and which continues still in vogue among some Indian ornithologists. This is, I must confess, inconvenient for Indian field-naturalists and collectors; but as, in my opinion, it was not possible to follow the above-mentioned system, and as the main object of this work is to endeavour to inculcate a taste for ornithology among *local students* of the science in Ceylon, it behoved me to adopt that system which appeared to me to accord best with the generally recognized affinities of the various orders into which the Ceylonese ornis divides itself, and at the *same time coincided best with the classification employed by Jerdon*, and which I am aware many who have taken up the study of ornithology in Ceylon are familiar with. The divisions adopted have been Orders (in one case also a Suborder), Families, and Subfamilies, and, in the great Order Passeres, Sections have also been made use of. The Accipitres, or Birds of Prey, have been granted precedence simply as a very favourite and specialized order, and because it has until recently been the practice among English ornithologists to follow Gray and place them first. The Psittaci, or Parrots in the possession of a cere and a very high degree of intelligence, seem to occupy a place not far distant from the Hawks. The interesting order Picariæ, in which the posterior margin of the sternum has a double notch, inasmuch as many of its groups possess zygodactyle feet, comes next the Parrots. The satisfactory arrangement of the vast order Passeres presents great difficulties; and here the system adopted by Mr. Wallace in classifying according to wing-structure has been adopted. The Columbæ (Pigeons) are a highly specialized order, and in preceding the Gallinæ, or Game-birds (aptly called Rasores, or "Scratchers," by some systematists), must of necessity come next the Passeres. In the arrangement of the remaining orders in the work (Grallæ, Gaviæ, Anseres, Pygopodes, Herodiones, and Steganopodes) I have followed the bent of my own views on the subject, considering these six orders as naturally divisible into two great classes—1st, those with *autophagous* or independent young; 2nd, those with *heterophagous* or dependent young. It is impossible to follow a linear arrangement; but nevertheless there *are* forms in each of the orders composing these two divisions which possess affinities for one another, and

consequently tend to group them in the rotation which they take in this work. The same rule has been followed, as much as possible, in considering the order in which the various families composing these orders should be arranged. It will not be necessary to enter into any disquisition in this Introduction on the much-disputed subject of classification, or to explain further my reasons for not following the more modern systems of Professors Parker and Huxley, or, still better, the modification of these systems by Messrs. Sclater and Salvin, as they have been sufficiently set forward in testifying above my desire to adopt a system best suited to the requirements of the local student, at the same time avoiding a total reversal of Gray's classification.

2nd. *Plan of the Articles.*—It has been thought best to define the characters of the various orders, families, subfamilies, genera, and species in accordance with their external characteristics, in order to simplify their comprehension to beginners. Reference is, however, made frequently to the sternum, a generally important, though not in some families (Scolopacidæ, for instance) always a reliable character.

The accompanying woodcut represents the sternum of the Malay Bittern (*Gorsachius melanolophus*), together with the bones attached to it. It has been selected as an example of a sternum with a single notch in the posterior margin. The various parts are named beneath.



st, sternum; *k*, keel of sternum; *no*, notch in posterior margin; *fu*, furculum; *co*, coracoid bones; *sc*, scapula.

In the great division Carinatæ, which comprises all living birds but the Ostrich family and its allies, the "carina" or keel is more or less deep so as to hold the powerful pectoral muscles which lie in the angle between it and the body of the sternum. In the latter (Ratitæ), however, the keel is slightly developed only, the sternum being flat, inasmuch as the same development of muscle is not required for non-flying birds. The furculum is in most birds a single bone, but in some Parrots, Pigeons, and Owls consists of two separate clavicles. In some genera of the Steganopodes it is anchylosed to the keel, and this latter is not produced to the posterior edge of the sternum.

The synonymy at the head of the articles is not supposed, by any means, to be complete. Besides local references, only those of a leading nature, as also relating to the recent writings of Indian ornithologists, more particularly contributors to 'Stray Feathers,' have been given, as these

were all that were necessary to the local student. Towards the close of the work I have been obliged to curtail the synonymy, even in its reduced form, and many Indian references have been omitted which did not relate to notes of much interest on the species in question. Mr. Ramsay's distribution list of Australian birds has been of much service to me as regards Australian distribution; but, owing to want of space, I have been unable to quote, except in one or two instances, this important contribution to Australian ornithology. In respect to Ceylon references, I have not quoted my paper on the "Distribution of the Birds in the Asiatic Society's Museum," contained in the local journal for 1874, as it was printed in mistake during my temporary absence from the island, and contained many errors in distribution, which, owing to the result of subsequent experience, I had intended to correct.

In regard to the local names for the birds of the island preference has been given to those used in Asiatic and Malayan countries, and, in the case of Waders and Water-birds, Heuglin's Egyptian names have been quoted. Sinhalese names have been supplied from Layard's catalogue and from a list furnished me by Mr. MacVicar, of the Survey Office, as well as from information obtained myself from the natives. This gentleman also supplied me with a list of Tamil and Ceylon-Portuguese names, which I have used throughout the work.

The measurements of specimens, with regard to which I have been particular, all relate to Ceylonese specimens in the flesh, except when the contrary is stated (as in the case of Waders and sea-birds particularly) in brackets. My system of wing-measurement, it is well to remark, consisted in straightening the metacarpal joint by pressure in the hand, or on the table in the case of large birds, and then measuring on the upperside of the wing. The dimensions attained in this manner exceed those taken of dried specimens, when the metacarpal joint has stiffened in the usual convex form, by from 0·1 to 0·3 of an inch. Contrary to the usage of most writers, I have placed the measurements before the description, simply because it is in accordance with the practice of field-naturalists to measure their specimens first. In the description of the plumage I have endeavoured to follow a uniform system throughout: beginning with the head and back, the wings and tail are then described, thus completing the upper surface; the lores and face are then mentioned, and *ensuite* the under surface, the under wing coming last.

It is hoped that the figure of a bird which has been engraved to show the various portions of the plumage in terms of scientific nomenclature will be of service to those who are not ornithologists, should they have occasion to peruse the description of the plumage of any species in which they may be interested.

The observation (*Obs.*) on each species has been given for the benefit of the *local student*, in order to furnish him with as much information as possible of allied species inhabiting India, and, in fact, the entire Oriental Region. Many of my observations on kindred species and genera may seem superfluous to the ornithologist in England, with numerous libraries at his command; but it is to be hoped that, as far as the naturalist in Ceylon is concerned, they will be of some use. Likewise with a view of assisting the local student, an *outline* of the entire *geographical distribution* of each species has been sketched out; this matter, again, may seem, to European readers, superfluous in a work of local nature.

As the system of spelling has recently been changed, I have followed, to the best of my knowledge, the new method, but which, however, I am bound to remark, is subject to variation* at the hands of those who conform to it. For instance, the names of some places are spelt differently in the road-maps of the Surveyor-General and in that published by the editor of the 'Observer'; for example, the name of a celebrated tank is spelt "Kantalay" in the one and "Kantaleyi" in the other, whereas, after the old spelling "Kandelay" was abolished, the word used to be spelt by some civil servants "Kanthelai," and as such it appears in this work. My readers will therefore, I trust, bear with the somewhat variable orthography of Ceylonese names in the 'Birds of Ceylon.'

In the early part of the work the name of the territorial division "Pattuwa" will be found, in some instances, incorrectly spelt "Pattu;" but in the map, compiled from road-maps of Provinces, kindly furnished me by Col. Fyers, R.E., I have followed in all instances the new method of spelling. The figures indicating the rainfall are taken from tables likewise furnished me by the Surveyor-General.

As regards the *nidification* paragraph, I regret to say, as far as local students are concerned, that I have been compelled largely to quote from Mr. Hume's 'Nests and Eggs,' owing to the difficulty in obtaining information about, or finding one's self, the nests of birds in Ceylon. Yet the admirable notes contained in that work are perhaps better than those which I could have obtained in the island. If, however, the Appendix be consulted much interesting additional information will be found supplied by my valued correspondent Mr. Parker, who has done more in Ceylonese oology than any recent collector.

It now remains for me to return my grateful thanks to the many ornithologists, naturalists, and collectors who have furnished me with assistance and information, and placed their valuable collections at my disposal during the time I have been compiling this work. I am much indebted, first and foremost, to Dr. Günther, Director of the Zoological Department of the British Museum, and to Mr. Bowdler Sharpe, Senior Assistant of the same; for, through the kind permission of the former, the vast collections, both mounted and in the skin, were placed at my disposal for purposes of comparison with my own; while the latter, under whose care these collections are placed, rendered me every assistance in the procuring and examination of the large series of specimens that it was necessary to examine, and was always ready and willing to impart information on difficult points with which his great experience and unexceptionally central position enabled him successfully to deal. Again, to Mr. Seebohm I am highly indebted for having placed at my disposal his large collections, the extensive Chinese series of skins collected by the late Mr. Swinhoe being of great service for purposes of comparison; also to Mr. Howard Saunders, who, as regards his particular group (the Laridæ), furnished me with much assistance. To Messrs. Gurney, Harting, Dresser, Sclater, Salvin, and Godman my thanks are likewise

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* Letters sent me from *Mannar*, spelt thus correctly by the writer, are impressed with the post-mark *Manaar*!

due for aid rendered as regards the several groups which they have made their study. I must not forget to acknowledge the assistance rendered to me by Mr. F. H. Waterhouse, Librarian of the Zoological Society, in answering my frequent queries as to references and data from the many scientific works required to be consulted, and which, from time to time, I omitted to collect while prosecuting my studies in London. Mr. Holdsworth's kindness in giving me access to his valuable collection of Ceylon birds, and also benefiting me by his opinion on matters connected with island distribution &c., has been of much service to me. The premature death of the late Marquis of Tweeddale, and the consequent closing to the scientific world for the time being of his collection, was no small loss to the author, who was at the time just entering on the study of the Passerine birds, and reaping the advantage of that correspondence which this distinguished ornithologist was always ready to enter into with his brother naturalists. By this untoward event an anticipated visit to the magnificent collection at Yester, which, on a former trip I had only time to glance at, was also put aside. On his return to England from Afghanistan, Captain Wardlaw Ramsay, into whose possession the collection passed, kindly lent me such specimens connected with the Third Part of the work as I required. To Canon Tristram, also, I am indebted for the loan of eggs and skins of several interesting species. I have likewise to acknowledge, with thanks, the receipt of information on various points from Herr Meyer, of the Royal Museum at Dresden, Herr Von Pelzeln of the Imperial Museum at Vienna, and Mr. Edward Nolan, Secretary of the Academy of Natural Sciences, Philadelphia. From a still more distant region, New Caledonia, I have had the advantage of correspondence with my enthusiastic forerunner in the field of Ceylon ornithology, Edgar Layard, who from time to time supplied me with details of his old experiences in the island.

Last, but not least, I must acknowledge with gratitude the aid I have received from my correspondents in India and Ceylon. Of the former I must mention particularly Mr. Allan Hume, C.B., and likewise not omit the names of Mr. Blanford, F.R.S., President of the Asiatic Society of Bengal, Captain Butler, 83rd Regt., and Dr. Edie, of the Madras Museum. In Ceylon my valued correspondents Messrs. Bligh and Parker, Ceylon Public Works Department, kept me constantly supplied with new material concerning the habits and nidification of many species: the former furnished me with copious notes on hill-birds, while the latter worked hard on the little-known districts of the north-west, and, being a most enthusiastic lover of birds and a close observer of Nature, the information supplied by him has been most valuable. In point of fact the better part of the Appendices is made up of material supplied by this gentleman from the Manaar district, where he has recently gone to be stationed. To Messrs. H. MacVicar, Forbes Laurie, R. Wickham, L. Holden, E. Cobbold, Captain Wade-Dalton, and other gentlemen now or formerly resident in the island, I am indebted for notes on the habits and local distribution of several interesting species. In conclusion, I am constrained to remark that had others among my Subscribers corresponded as vigorously with me during the progress of the work as Messrs. Bligh, Parker, and MacVicar, much more local information would have been contained in it.

W. V. L.

SYSTEMATIC INDEX.

Order **ACCIPITRES.**

Suborder FALCONES.

Family VULTURIDÆ (**1 species**).

Subfamily	Species	Page	App. Page
Subfam. VULTURINÆ	Neophron ginginianus, *Lath.*	2	

Family FALCONIDÆ (**30 species—2 doubtfully identified**).

Subfamily	Species	Page	App. Page
Subfam. ACCIPITRINÆ	Circus æruginosus, *Linn.*	5	
	Circus melanoleucus, *Forster*	9	
	Circus cineraceus, *Mont.*	12	
	Circus macrurus, *S. G. Gmelin*	17	1209
	Astur trivirgatus, *Temm.*	20	
	Astur badius, *Gmelin*	23	
	Accipiter virgatus, *Temm.*	26	
	Accipiter nisus, *Linn.*	27	
Subfam. BUTEONINÆ	Buteo plumipes, *Hodgson*	31	
Subfam. AQUILINÆ	Nisaetus fasciatus, *Vieill.*	36	
	Nisaetus pennatus, *Gmelin*	40	
	Lophotriorchis kieneri, *G. Sparre*	43	
	Neopus malayensis, *Temm.*	47	1209
	Spizaetus kelaarti, *Legge*	51	1209
	Spizaetus ceylonensis, *Gmelin*	55	1209
	Spilornis spilogaster, *Blyth*	61	
	Haliaetus leucogaster, *Gm.*	67	1209
	Polioaetus ichthyaetus, *Horsf.*	72	1209
	Haliastur indus, *Bodd.*	76	
	Milvus govinda, *Sykes*	80	1209
	Elanus cæruleus, *Desf.*	85	
	Pernis ptilonorhynchus, *Temm.*	89	

Family FALCONIDÆ (*continued*).

Subfamily	Species	Page	App. Page
Subfam. FALCONINÆ	Baza ceylonensis, *Legge*	94	1209
	Baza lophotes, *Temm.*	98	1209
	Falco peregrinus, *Tunstall*	101	1209
	Falco peregrinator, *Sund.*	106	1210
	Falco severus, *Horsf.*	110	
	Falco chicquera, *Daud.*	110	
	Cerchneis tinnunculus, *Linn.*	114	
	Cerchneis amurensis, *Radde*	119	

Suborder PANDIONES (**1 species**).

Pandion haliaetus, *Linn.* 122

Suborder STRIGES.

Family BUBONIDÆ (**11 species—1 doubtfully occurring**).

Subfamily	Species	Page	App. Page
Subfam. BUBONINÆ	Ketupa ceylonensis, *Gm.*	127	
	Bubo nipalensis, *Hodgs.*	131	1210
	Scops bakkamuna, *Forster*	135	1210
	? Scops malabaricus, *Jerdon*	..	1210
	Scops sunia, *Hodgs.*	139	
	Scops minutus, *Legge*	142	
	Ninox scutulata, *Raffl.*	145	
	Glaucidium castanonotum, *Blyth*	149	
	Glaucidium radiatum, *Tick.*	152	
Subfam. SYRNIINÆ	Syrnium indrani, *Blyth*	155	
	Phodilus assimilis, *Hume*	161	1210

Family STRIGIDÆ (**1 species**).

Strix flammea, *Linn.* 164

Order **PSITTACI.**

Family PSITTACIDÆ (**5 species—1 doubtfully occurring**).

Subfamily	Species	Page	App. Page
Subfam. PALÆORNINÆ	Palæornis eupatrius, *Linn.*	168	1210
	Palæornis torquatus, *Bodd.*	171	
	Palæornis cyanocephalus, *Linn.*	174	1211
	Palæornis calthropæ, *Layard*	177	1211
	? Palæornis columboides, *Vigors*	..	1211

Family TRICHOGLOSSIDÆ (**1 species**).

Loriculus indicus, *Gm.* 180 1212

Order PICARIÆ.

Family PICIDÆ (10 species—1 doubtfully determined).

Subfamily	Species	Page	App. Page
Subfam. PICINÆ	Picus mahrattensis, *Lath.*	184	1212
	Yungipicus gymnophthalmus, *Blyth*	186	1212
	Chrysocolaptes stricklandi, *Layard*	188	
	Chrysocolaptes festivus, *Bodd.*	191	1212
Subfam. GECININÆ	Gecinus striolatus, *Blyth*	194	1212
	Chrysophlegma xanthoderus, Malh.*	197	1211
	Chrysophlegma chlorigaster, *Jerdon*	..	1211
	Micropternus gularis, *Jerdon*	200	1212
	Brachypternus ceylonus, *Forster*	202	1212
	Brachypternus puncticollis, *Malh.*	205	1212
	? Brachypternus intermedius †, *Legge*	205	1212, 1224

Family CAPITONIDÆ (4 species).

Subfamily	Species	Page	App. Page
Subfam. MÆGALÆMINÆ	Megalæma zeylanica, *Gm.*	208	
	Megalæma flavifrons, *Cuv.*	212	1213
	Xantholæma rubricapilla, *Gm.*	215	
	Xantholæma hæmacephala, *Müll.*	218	

Family CUCULIDÆ (16 species).

Subfamily	Species	Page	App. Page
Subfam. CUCULINÆ	Cuculus canorus, *Linn.*	221	
	Cuculus micropterus, *Gould*	228	
	Cuculus poliocephalus, *Lath.*	231	
	Cuculus sonnerati, *Lath.*	233	
	Cuculus passerinus, *Vahl*	235	
	Cuculus maculatus, *Gm.*	238	
	Hierococcyx varius, *Vahl*	240	
	Surniculus lugubris, *Horsf.*	243	
	Coccystes jacobinus, *Bodd.*	246	
	Coccystes coromandus, *Linn.*	249	
	Eudynamys honorata, *Linn.*	251	
Subfam. PHŒNICOPHAINÆ	Phœnicophaës pyrrhocephalus, *Forster*	255	
	Zanclostomus viridirostris, *Jerd.*	258	1213
	Centropus rufipennis, *Illiger*	260	1213
	Centropus chlororhynchus, *Blyth*	263	
	Taccocua leschenaulti, *Lesson*	266	

Family TROGONIDÆ (1 species).

Harpactes fasciatus, *Forster* 269

* Incorrect title at head of article.

† *Vide* description of "Red Race."

Family BUCEROTIDÆ (2 species).

		Page	App. Page
	Anthracoceros coronatus, *Bodd.*	272	1224
	Tockus gingalensis, *Shaw*	275	1213, 1224

Family UPUPIDÆ (1 species).

		Page	App. Page
	Upupa nigripennis, Gould*	278	1213
	Upupa ceylonensis, *Reich.*	..	1213

Family CORACIIDÆ (2 species).

		Page	App. Page
Subfam. CORACIINÆ	Coracias indica, *Linn.*	281	
	Eurystomus orientalis, *Linn.*	285	1213

Family ALCEDINIDÆ (6 species).

		Page	App. Page
Subfam. ALCEDININÆ	Ceryle rudis, *Linn.*	288	
	Alcedo bengalensis, *Gm.*	292	
Subfam. HALCYONINÆ	Pelargopsis gurial, *Pearson*	295	
	Halcyon smyrnensis, *Linn.*	298	
	Halcyon pileata, *Bodd.*	301	
	Ceyx tridactyla, *Pall.*	303	1213, 1224

Family MEROPIDÆ (3 species).

		Page	App. Page
	Merops philippinus, *Linn.*	306	1213
	Merops viridis, *Linn.*	309	1213
	Merops swinhoii, *Hume*	312	1213

Family CYPSELIDÆ (6 species).

		Page	App. Page
	Chætura gigantea, *Temm.*	314	1214
	Cypselus melba, *Linn.*	317	
	Cypselus affinis, *J. E. Gray*	319	
	Cypselus batassiensis, *Gray*	322	
	Collocalia francica, *Gm.*	324	1214
	Dendrochelidon coronatus, *Tickell*	328	1214, 1224

Family CAPRIMULGIDÆ (4 species).

		Page	App. Page
Subfam. STEATORNINÆ	Batrachostomus moniliger, *Layard*	331	
Subfam. CAPRIMULGINÆ	Caprimulgus kelaarti, *Blyth*	337	
	Caprimulgus atripennis, *Jerd.*	340	
	Caprimulgus asiaticus, *Lath.*	343	

* Incorrect title at head of article.

Order **PASSERES.**

Family CORVIDÆ (**3 species**).

		Page	App. Page
Subfam. CORVINÆ	Corone macrorhyncha, *Wagler*	346	
	Corone splendens, *Vieill.*	349	
	Cissa ornata, *Wagler*	353	

Family ORIOLIDÆ (**2 species**).

	Page	App. Page
Oriolus diffusus, Sharpe* / Oriolus indicus, *Jerd.*	355	1214
Oriolus indicus, *Jerd.*	..	1214
Oriolus melanocephalus, *Linn.*	357	

Family CAMPOPHAGIDÆ (**4 species**).

	Page	App. Page
Graucalus macii, *Lesson*	360	1214
Pericrocotus flammeus, *Forster*	363	1224
Pericrocotus peregrinus, *Linn.*	366	1214, 1224
Lalage sykesi, *Strickl.*	369	1214

Family PRIONOPIDÆ (**2 species**).

		Page	App. Page
Subfam. PRIONOPINÆ	Tephrodornis pondicerianus, *Gm.*	372	1214, 1225
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* Incorrect title at head of article.

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ERRATA ET CORRIGENDA.

Page 85, 2nd line of synonymy, for *vociferans* read *vociferus*.

119, line 21 from bottom, *after* cere, *eliminate brackets, and read* cere, all but the tip of bill.

174, 2nd line of synonymy, *for* 1786 *read* 1788.

186, at head of article, *for* GYMNOPHTHALMOS *read* GYMNOPHTHALMUS.

224, 5th line of *Nidification*, *for* it is *read* they are.

273, line 8 from bottom, *for* Nikerawettiya *read* Nikaweratiya.

319, in 4th line of *Observation*, the semicolon *should precede* "in."

463, at head of article, MYIOPHONUS should be more correctly MYIOPHONEUS.

647, line 18, for *H. hypoxanthus* read *P. hypoxanthus*.

674, line 25 from bottom, *for* 1856 *read* 1866.

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Map of Distribution.
Outline of Crow.
Extra Egg-Plate.

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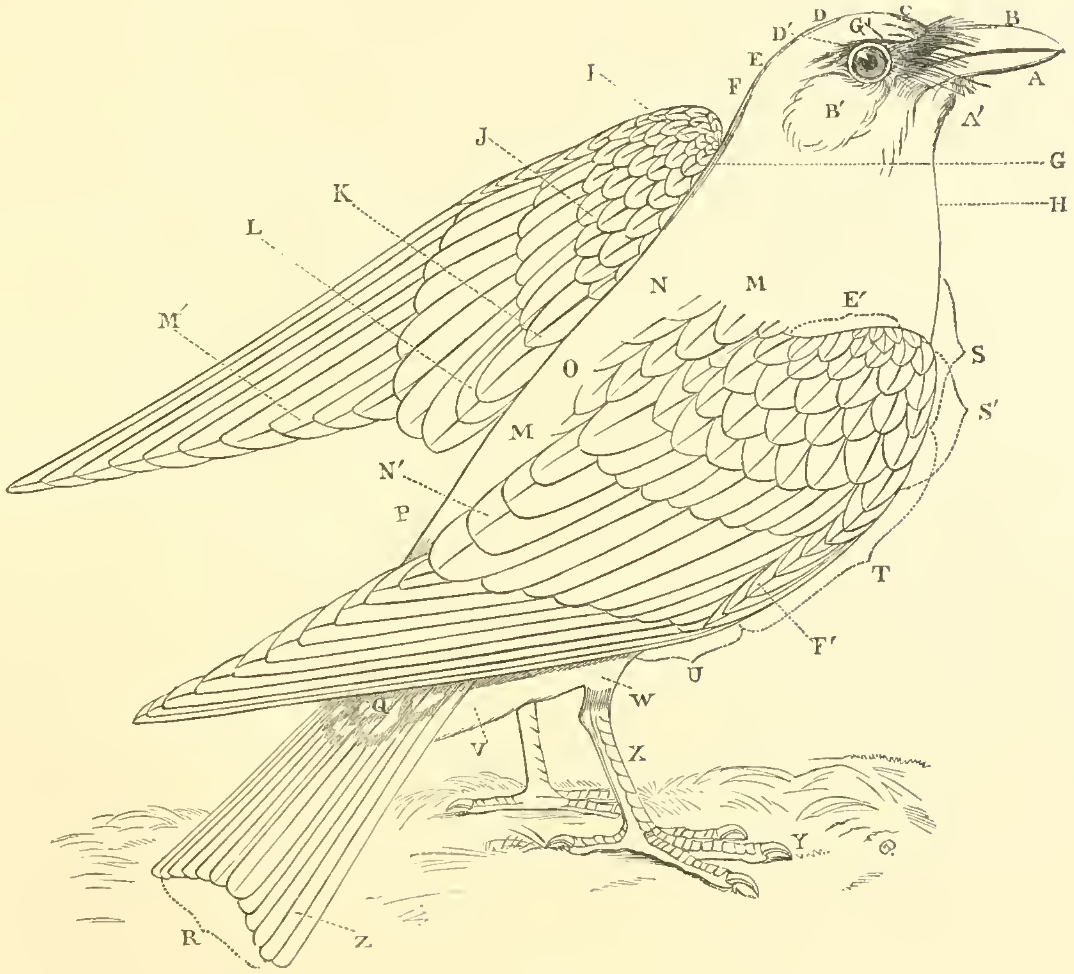

A. Gonys.
A′. Chin.
B. Culmen.
B′. Ear-coverts.
C. Forehead.
D. Crown.
D′. Supercilium.

E. Occiput.
E′. Ulna.
F. Nape.
F′. Winglet.
G. Hind neck.
G′. Lores.
H. Fore neck.

I. Lesser wing-coverts.
J. Median wing-coverts.
K. Greater wing-coverts.
L. Secondaries.
M, M. Scapulars.
M′. Primaries.
N. Interscapular region.

N′. Tertials.
O. Back.
P. Rump.
Q. Upper tail-coverts.
R. Rectrices.
S. Chest.
S′. Metacarpus.

T. Breast.
U. Abdomen.
V. Under tail-coverts.
W. Tibia.
X. Tarsus.
Y. Middle toe.
Z. Penultimate rectrix.

BIRDS OF CEYLON.

Order ACCIPITRES.

Bill short, strong, stout at the base, the upper mandible longer than the lower, the culmen strongly curved, the direction of the tip perpendicular; nostrils placed in a cere or soft membrane. Wings with ten primaries. Feet strong, armed with powerful talons of an elongated conical shape, curved, sharp, and rather smooth. Talons capable of being bent under the feet, the inner one stronger than the others. (*Sundevall* in part.)

Suborder FALCONES.

Eyes placed laterally in the head; no facial disk. Tail generally with twelve feathers, in some with fourteen. Outer toe not reversible; toes bare. Plumage compact.

Fam. VULTURIDÆ.

"Head naked, or clothed with down; no true feathers on crown of head; nostrils not perforated, rounded, perpendicular, or horizontal." (*Sharpe*, Cat. Birds, i. p. 2.)

ACCIPITRES.

VULTURIDÆ.

VULTURINÆ.

Genus NEOPHRON.

Differs from the other genera of its family in having the bill long and slender, and the tip much curved; in the cere being more than half the length of the bill, with the nostrils placed horizontally in it; the head is bare only to the occiput; the wings much pointed, the 3rd quill being the longest, the tail wedge-shaped, and the membranes uniting the toes ample.

NEOPHRON GINGINIANUS.

(THE LESSER SCAVENGER-VULTURE.)

Vultur ginginianus, Lath. Ind. Orn. i. p. 7 (1790); Daud. Traité, ii. p. 20 (1800).

Neophron percnopterus, Blyth, Ann. Nat. Hist. 1844, xiii. p. 115; Jerdon, B. of Ind. i. p. 12; id. Ibis, 1871, p. 236.

Neophron ginginianus, Gray, Hand-l. of B. i. p. 4; Hume, Rough Notes on Indian Raptores. i. p. 31; id. Nests and Eggs (Rough Draft), i. p. 9; Sharpe, Cat. Birds, i. p. 18; Legge, Str. Feath. 1876, p. 195 (first record from Ceylon); Hume, Str. Feath. i. p. 150.

Gingi Vulture of Latham; *White Scavenger-Vulture*, Jerdon, Birds of India.

"*Pharaoh's Chicken*," "*Pharaoh's Hen*," "*Dirt-bird*," popularly in India and Egypt.

Kal-Murgh, Hind. Shikarees; *Manju-Tiridi*, Tam., lit. "Turmeric-stealer," also *Pittri-gedda*, lit. "Dung-Kite."

Adult male and female. Length to front of cere 21·0 to 23·5 inches; culmen from cere 1·35; wing 18 to 19, reaching to tip of tail; tail 8·5 to 10·5; tarsus 3; mid toe 2·4 to 2·5, its claw (straight) 0·85: bill, gape to tip, 2·4.

Iris brown; naked skin of the head, face, and throat yellow; cere yellow, bill yellowish horny; legs and feet fleshy yellow.

Above, the neck, back, scapulars, wing-coverts, including the lesser primary-coverts, tail, entire under surface with the under wing-coverts white; primaries and winglet green-black, the outer webs of the long quills, from the notch to the base, and the entire web of the shorter quills pervaded with greyish; secondaries dusky greenish black, the outer webs towards the tips silvery whitish; tertials brown, changing into whitish towards the tips.

Young. Birds of the year have the head partly clothed with short rudimentary feathers; a broad blackish stripe passes from the forehead over the centre of the crown, and spreads out on the occiput; the lores are divided by a narrow blackish stripe, running forward to the cere; upper surface blackish brown, deepest on the back and sides of the neck and the chest, and paling into dark brown on the scapulars and wing-coverts; feathers of the back, scapulars, and wing-coverts more or less broadly tipped with fulvous; upper tail-coverts fulvous brown; tail pale brown, tipped with fulvous grey; quills black, as in the adult, but the outer webs washed with brownish grey at the tip:

breast and abdomen brownish, the feathers tipped with fulvous; under tail-coverts fulvous; under wing brown, with fulvous tippings along the edge.

With age the whole of the upper surface pales, the median wing-coverts remaining darker than the rest of the wing and the back; the sides of the neck likewise remain dark, while the rest of the under surface becomes "light brownish;" the upper tail-coverts are paler than the rump during the transition stage. Examples, however, vary in their mode of acquiring the adult plumage, the back of the neck in some being quite blackish, while the back and wing-coverts are almost white.

Obs. This species is distinguished by Mr. Sharpe, in his 'Catalogue of Birds,' from that common to Egypt and the countries surrounding the Mediterranean and Red Seas, on account of its smaller size and yellow bill. Mr. Hume, however, is unable as yet to determine whether there is any constant difference in size or colour of bill to be depended on. He remarks (Str. Feath. i. p. 151) that he has "procured and measured numerous specimens in many different parts of India, both of black- and yellow-billed birds, and with and without more or less of slender white feathers on the throat," and that he is unable to detect any marked distinction as regards size in the two. When a very large series from different localities can be got together, this point may perhaps be satisfactorily determined.

Distribution.—The Scavenger-Vulture of India can only take its place in the avifauna of Ceylon as the veriest straggler. An immature example made its appearance at Nuwara Elliya in March 1874, and was shot by Mr. Grinlinton, of the P. W. Department, while roaming about the bazaar in search of food. Its occurrence at that season of the year in the highlands of Ceylon proves it to have been driven to the south by the north-east monsoon, a wind which often brings Indian Raptores, not usually found in such low latitudes, to the island. It is therefore not improbable that, under similar circumstances, it may again find its way to Ceylon.

On the continent the White Scavenger-Vulture, if it be considered distinct from the Egyptian bird, is, according to Jerdon, "abundant throughout the greater part of India, being more rare in Central and Northern India, and unknown in lower Bengal." Subsequent observers record it as being numerous in stated localities, such as the Nilghiris, Northern Guzerat, in Sindh, Rajpootana, Khandala, and even in the subsidiary ranges of the Himalayas, where, according to Mr. Hume, it breeds up to 8500 feet. Mr. Brooks, in a paper on the birds of the Suliman hills, in 'Stray Feathers,' 1876, remarks that he found it more abundant in that locality than anywhere in India, owing probably to the fact of there being no other Vultures there to dispute the territory with it and rob it of its easily-earned and noxious food.

Habits.—This Vulture, which, from its unclean propensities, is perhaps the least interesting of its family, is nevertheless an important support to the somewhat deficient sanitary customs which usually obtain about native villages and bazaars in India. By reason of its weak bill, it is unable to tear the flesh of carrion in company with other Vultures, of which it, moreover, is said to stand in considerable fear, and it therefore subsists by devouring all sorts of offal and other disgusting substances.

It is a denizen of most towns and villages in India, and, in common with the Grey Crow, displays an utter fearlessness of man, frequenting the dirtiest native quarters, or hovering round the abattoirs, where it appeases its ravenous appetite on the refuse thrown out during the night. It does not, however, confine itself to the vicinity of human habitations, being often found about open country, both flat and hilly, and likewise on the borders of such large sheets of water as the Sambhur lake, &c.

Like its near ally, the Egyptian Vulture, which I have seen easily advancing with almost motionless wings against a strong wind, this species has considerable powers of flight. Its usual mode of progression is with heavy and rather measured flappings of the wing; but when collected in flocks near some tempting spot it soars to a considerable height, and takes a quiet survey of the ground beneath it. It passes much of its time on the ground after feeding, and stands with an erect deportment. Jerdon remarks that it walks with ease, lifting its legs very high.

Nidification.—The spots chosen by this bird to nest in are the tops of walls, buildings, temples, &c., and in the upper branches of large trees in the vicinity of houses. The nests are described by various writers as untidy, rather loosely-put-together structures of sticks and large twigs, with but a slight depression in the centre, which is lined with rags, pieces of cloth, wool, and the many suitable substances to be found about

human dwellings. Mr. Hume mentions having found nests entirely lined with human hair, while others had nothing but green leaves to protect the eggs. These are usually two in number, but sometimes three, broad oval in shape, of a greyish-white or reddish ground-colour, and covered with very variable markings. Mr. Hume remarks, in his 'Nests and Eggs,' that "every possible shade of brownish red and reddish brown is met with, and every degree of marking, from a few distinct scattered specks to streaks and blotches, nearly confluent over the greater portion of the egg's surface." They average 2·6 inches in length by 1·98 in breadth.

Fam. FALCONIDÆ.

"Crown of the head always clothed with feathers, though the sides of the face are often more or less bare. Outer toe (except in the *Polyborinæ*) only connected to the middle toe by interdigital membrane." (*Sharpe*, Cat. Birds, i. p. 30.)

Subfam. ACCIPITRINÆ.

"Outer toe connected to middle toe by an interdigital membrane; tibia and tarsus to all intents equal in length, the difference between them not so great as the length of hind claw." (*Sharpe*, Cat. Birds, i. p. 46.)

ACCIPITRES.

FALCONIDÆ.

ACCIPITRINÆ.

Genus CIRCUS.

Bill accipitrine, short, moderately robust, compressed, high at the base, the culmen curved gradually from the base of the cere to the hooked tip; margin slightly festooned. Nostrils large, oval, placed forward in the cere, and protected by the bristles of the lores. Wings long and pointed, the 3rd and 4th quills subequal and longest. Tail long, even or rounded at the tip. Tarsus long, subequal with the tibia, slender, covered in front with transverse, behind with large reticulated scutæ, plumed a little below the knee. Toes slender, the outer and the middle connected at the base by a membrane; the middle toe about half the length of the tarsus; inner toe short; claws much curved and very acute. Lower part of face surrounded by a ruff of thick-set feathers, forming a partial disk.

CIRCUS ÆRUGINOSUS.

(THE MARSH-HARRIER.)

Falco æruginosus, Linn. S. N. i. p. 130 (1766).

Falco rufus, Gm. S. N. i. p. 266; Yarr. Brit. B. i. p. 90.

Circus æruginosus, Savign. Syst. Ois. Egypte, p. 90 (1809); Gray, Gen. B. i. p. 32; Schl. Vog. Nederl. pls. 20–22; Jerdon, B. of Ind. i. p. 99; Gould, B. Gt. Br. pt. xiii.; Hume. Rough Notes, ii. p. 314; Holdsworth, P. Z. S. 1872, p. 414 (first record from Ceylon); Sharpe, Cat. Birds, i. p. 69; Legge, Ibis, 1874, p. 10, 1875, p. 278, 1876, p. 126; Scully, Str. Feath. 1876, p. 126.

Le Busard roux, Brisson, also *Le Busard de Marais*.

Moor-Buzzard, Albin, Birds, i. pl. 3 (1731), also popularly in England; "*Harpy*" of some writers; *Swamp-Hawk*, *Paddy-field Hawk*, Sportsmen in Ceylon.

Mat-chil, Beng., lit. "Meadow-Kite"; *Sufeid Sira* of Mussulmen in Bengal (*apud* Jerdon).

Akbash-Sā, Turkestan, lit. "White-headed Kite."

Kurula-goya, Sinhalese; *Prāndu*, Tam.

Adult male and female. Length to front of cere 20·0 to 21·25 inches; culmen from cere 1·0 to 1·21; wing 15·5 to 16·6: tail 8·5 to 9·5; tarsus 3·2 to 3·9; mid toe 1·9 to 2·0, claw (straight) 0·8 to 0·9; height of bill at cere 0·43 to 0·45.

Obs. There is no constant difference in the size of males and females, some of the former equalling if not exceeding the largest of the latter.

Iris golden yellow, cere yellow; bill black; base of under mandible, legs, and feet yellow; claws black.

Fully matured plumage. Head and nape buff-white, deepening into rufescent buff on the hind neck; the feathers of the head with clear, blackish-brown mesial stripes, increasing in width on the hind neck, on the lower part of which they spread over the feather into the deep glossy brown of the back, scapulars, median wing-coverts, and longer tertials; in some examples, probably the oldest, the head-streaks are reduced to narrow shaft-lines; least wing-coverts above the flexure and along the ulna, in the female, buff, with dark central streaks overcoming the feathers on the lower series; the median wing-coverts and the scapulars margined with indistinct rufous; upper tail-coverts pale grey, often shaded with tawny patches, and the basal portion of the feathers white; greater wing-coverts, secondaries, primaries (with the exception of the four longer quills), their coverts, and the winglet dull silver-grey, with dark shafts; longer primaries black; basal portion of the inner webs of all the quills, edge of the wing, and under wing-coverts pure white; tail paler grey than the wings, with a whitish tip and a brownish hue near it; the shafts white.

Lores and round the eye slaty blackish, with the bases of the feathers white; ear-coverts brownish, edged with tawny; ruff blackish brown, margined broadly with buff; throat, chest, and breast buff; the chin with narrow dark shaft-lines, and the remainder regularly marked with broad, pointed, sepia-brown streaks, paling on the lower parts into dull rufous, and spreading over the feathers, which are often pale-margined, or with buff bases showing here and there on the surface; under surface of tail whitish.

In such fully matured birds the lower parts vary much, the feathers in some being as pale-margined as the breast.

A younger stage, but one in which the bird is adult, and which is more frequently met with than the above, has the head and hind neck rufescent buff, the feathers with broad mesial brown stripes; the forehead is not so pale as the crown, and the ear-coverts are conspicuously brown; the shorter primaries are dusky, or not so grey as the coverts; the fore neck and chest, and sometimes the better part of the breast, are rufous-buff, with rufous-brown stripes, while the whole of the lower parts, including the under tail-coverts, are dark rufous, with dark stripes on the breast; under wing-coverts rufescent.

Young. Iris brown; cere, legs, and feet greenish yellow, the bill sometimes greenish about the base of lower mandible.

Whole upper surface, wings, and tail uniform dark brown, while the entire under surface from the throat down is chocolate-brown; the forehead, crown, and chin buff, with narrow brown shaft-stripes; the tail is tipped with buff, and the feathers of the lower parts, in some examples, very finely margined with the same. Occasionally the forehead and crown are both brown and the buff confined to the nape, while very rarely the entire bird is a very dark brown.

Progress with age. The brown iris becomes mottled with yellow, and the cere becomes yellowish above, the legs losing at the same time their greenish hue.

The buff of the head spreads down the hind neck, increases on the throat, and a patch of the same appears on the chest; in females the lesser wing-coverts become rufescent buff, with dark central streaks; the under wing-coverts pale into rufous, but the quills remain as in the nestling plumage. Examples killed at the end of the season in Ceylon are usually in this dress, which is probably acquired by a change in the feather itself.

At the next moult, the buff continues to spread chiefly on the fore neck, uniting in some cases with the pale space on the chest; the lower parts become dark rufous; the primary-coverts, secondaries, and their coverts are pervaded with grey; the upper tail-coverts are rufous, the lower feathers tipped with ashy, and the tail is brownish ashy.

Obs. The amount of yellow on the upper surface varies much in all these adolescent stages, some examples having the feathers of the lower back even broadly margined with it; it varies, in females, on the wing-coverts, and in all males I have ever examined is absent from that part.

Distribution.—This large Harrier (or the Moor-Buzzard, as it is sometimes called in England) arrives in Ceylon on its annual migration southwards through India in November, and remains in the island until the usual month of departure, the following April. It confines itself chiefly to the sea-coast, and is even there somewhat local in its distribution. Although tolerably numerous on the open plains of the Jaffna peninsula and about the vast rush-beds at the lower end of the great Jaffna *lagoon*, as well as on the coasts of both sides of the island as far as Manaar and the delta of the Mahawelliganga, it is equally so, during some seasons, in the extreme south of the island, and makes its appearance there as early, if not earlier, than in the north.

There can, I think, be no doubt that our seasonal migrants arrive from the north in two separate streams—the one from the north-east driven across the Bay of Bengal from Burmah and the eastward-trending coast to the north of the Godavery; the other making its way down with what is called the "long-shore wind" of October and November from the southernmost point of the Carnatic or the region about Cape Comorin, and landing

its components on the south-western shores of Ceylon. In the case of more species than one, to be hereafter noticed, I have observed migrants in the extreme south at an earlier date than in the very north of the island. The Marsh-Harrier is more numerous some seasons than others; and this irregularity in its numbers was particularly noticeable at Galle in 1871 and 1872, in the first of which years it was so common that it now and then frequented, one or two at a time, the open and public esplanade without the fort walls, coming into the "camp" and sitting on the ground near the barracks; it was at the same time to be found in the marshes all through the district. In the following year, however, I noticed very few examples anywhere in that part of the island. It frequents the paddy-lands and swamps far up the Gindurah, and is likewise found in the interior of the country to the north of Hambantota, as well as in swampy districts along the south-east coast as far as the irrigated plains below the Batticaloa lake, the largest tract of paddy-land in the island and a favourite locality for all marsh-loving birds. I have not unfrequently seen it on the swamps between Colombo and Kotté.

As regards its geographical range, the Marsh-Harrier is one of the most widely diffused of its genus. It may be said to have its permanent headquarters in Europe and Siberia, south of 60° N. lat., and in Western Asia as far as the region immediately north of the Himalayas. In the non-breeding season, however, its wandering propensities carry it over an immense portion of the Old World. It migrates through all India and into China and Japan, spreading southward even into the Philippines. In Africa it spreads over Egypt and Abyssinia, Algiers, and Eastern Morocco, and reaches the Canary Islands, where Professor Newton, in his edition of Yarrell, says that Ledru obtained it in the island of Teneriffe. It occurs likewise in South Africa, where Mr. Ayres procured it in the Transvaal Republic. It is most abundant in the marshy districts of Europe, being very common in Turkey, and swarming, according to Mr. Howard Saunders, in the marshes of the Guadilquivir. Since the draining of the fens and marshes in England, it has become, according to Professor Newton, almost entirely banished.

Habits.—The Marsh-Harrier, as its name implies, is a denizen of swamps, fens, damp moor-land, marshes, wet pasture-lands, and, in the East, of tracts of rice or "paddy" cultivation, which supply it with the same kind of food as the first-named localities. It is a bird of powerful but heavy flight, traversing considerable distances with a few strokes of its long wings, followed by onward sweeps, in the course of which it guides itself along just above the ground, ready to drop on the first prey which it espies. It is by no means a shy bird, either when seated or on the wing, and in the course of its beating round or crossing a piece of ground will fly close to the sportsman.

It is the most predatory of all the Harriers, not contenting itself with living on reptiles, frogs, rats, and other small mammals, but seizing wounded Snipe and other birds without fear of the gun, and capturing fish with as much skill as the Fish-Hawk. I have killed it with a large Lulu*, weighing nearly two pounds, in its talons, and have likewise detected the remains of young Pipits in the stomach of one shot in the marshes of Jaffna. On seizing a lizard or snake, these birds usually devour it there and then, fixing it to the ground with the talons, in the same manner that any ordinary Hawk pins its prey to a branch.

The Moor-Buzzard sometimes soars to a great height, circling round and round above swamps and marshes, and on account of its large size has much the appearance of an Eagle in the distance, until its long tail be observed, this feature at once ensuring its identification. It perches on the ground like its congeners, but not unfrequently rests on dead trees at the borders of marshes, and is the only Harrier I have seen thus perched in Ceylon.

In his interesting paper on the birds of Turkestan, Dr. Scully remarks that besides feeding on frogs, rats, and lizards, the Marsh-Harrier kills the Reedling (*Calamophilus biarmicus*), this little bird no doubt coming constantly beneath its notice as it hovers round the reed-beds of swamps in that country.

Nidification.—This species, it appears, has been known to breed in India, Mr. Hume having received a pair of eggs taken near the Kistna river. The natives of Oudh have also informed that gentleman that it breeds in their province; and as it has been shot in other parts of the country during the breeding-season, it seems certain that a few birds breed within the Indian limits. The nest is said to be placed on the ground. among sedge or reeds, and to be made of sticks, rushes, or coarse grass.

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* A common freshwater fish in Ceylon.

Mr. A. B. Brooke, in his notes on the ornithology of Sardinia ('Ibis,' 1873, p. 154), writes as follows concerning a nest in the neighbourhood of Oristano, where these Harriers swarm:—"A nest I found in the end of April was built in the middle of a reedy, marshy lake, placed halfway up the stems of the reeds, *just clear of the water*; the bottom was formed of rough coarse sticks, and the interior of dried matted rushes, in some cases with their roots attached, the egg lying carelessly in the middle." "The eggs are usually three in number, white, with a pale greenish tinge, and sometimes slightly spotted with bright reddish brown. They measure from 2·08 to 1·84 inch in length, by 1·58 to 1·44 inch in breadth"*. Mr. Hume describes some eggs in his collection as having a good number of markings, consisting, in one instance, of specks and spots chiefly at one end, and in another of large blotches and smears of pale brown.

Mr. Hewitson remarks that the eggs are "most commonly white," though they are sometimes spotted. This variation in their character accounts for the difference of opinion expressed by Montagu, Latham, and Selby on the subject. The figure in Mr. Hewitson's plate represents a slightly-marked egg, there being a few small spots of pale reddish scattered pretty evenly over the surface and intermingled with some pale blotches of bluish grey. As many as five eggs are sometimes laid, though four is the usual number.

* Newton's ed. Yarr. Brit. Birds, p. 130.

CIRCUS MELANOLEUCUS.

(THE PIED HARRIER.)

Falco melanoleucus, Forster, Ind. Zool. p. 12, pl. 11 (1781).

Circus melanoleucus, Vieill. N. Dict. d'Hist. Nat. iv. p. 465 (1816); Gray, Gen. Birds, i. p. 32; Kelaart's Prodromus, Cat. p. 115; Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 105; Jerd. B. of Ind. i. p. 98; Hume, Rough Notes, ii. p. 307; Holdsworth, P. Z. S. 1872, p. 414; Sharpe, Cat. Birds, i. p. 61 (1874); Hume, Stray Feath. vol. iii. p. 33; Swinhoe, Ibis, 1874, p. 266, pl. 10; Gurney, Ibis, 1875, pp. 226–7, and 1876, p. 130; Hume, Str. Feath. vol. v. p. 11 (1877).

The Black-and-White Falcon, Pennant, Ind. Zool. p. 33, pl. 2 (1790); Kelaart, Prodromus.

Pahatai, Hind.; *Ablak Petaha*, Nepalese (*apud* Jerdon).

Kurula-goya, Sinhalese.

Adult male. Length to front of cere 16·5 to 18 inches; culmen from cere 0·75; wing, of 5 examples from different parts of India, 13·7, 13·9, 14·2, 14·2, 14·5; tail 8·2 to 9; tarsus 2·9 to 3·25; mid toe 1·2 to 1·4, claw (straight) 0·55; height of bill at cere 0·35.

Obs. In Mr. Hume's table of measurements of 34 old males (Str. Feath. vol. v. p. 12) the wings range from 13·2 to 14·34 inches, and the tarsi from 2·8 to 3·25.

Iris bright golden yellow; cere varying from grey to greenish yellow; bill black, paling into leaden at the base; legs and feet chrome-yellow.

Entire head, neck, chest, back, upper scapular feathers, and median wing-coverts black, glossy on the upper parts and dull on the fore neck and chest; least and greater wing-coverts, point of the wing, shorter primaries, secondaries, rump, and upper tail-coverts pale silvery grey, the quills brownish at the tips; longer primaries blackish on the terminal half, with the bases of the inner webs white; tertials brownish near the tips, much darker in some examples than in others; tail light sullied grey, paler on the lateral feathers; shafts of all but the latter feathers brownish; beneath from the chest, together with the under wing, pure unmarked white.

Young. Iris "ochreous yellow" (Swinhoe); cere greenish grey or greenish yellow; gape and loreal skin yellowish; bill pale at the base.

I subjoin here the description of Mr. Swinhoe's specimen, figured in 'The Ibis,' 1874, inasmuch as it appears, according to Mr. Gurney's judgment ('Ibis,' 1875, p. 226), to be, in all probability, the first plumage of the bird:—"Upper parts light brown, the feathers on the back dark-stemmed. Crown, nape, and scapulars blackish brown in centre of feathers, with broad yellowish-red margins. Underparts light buff, with yellowish-brown streaks, broad and darker on the breast; tibials and vent chestnut-buff, with darker stems to feathers. Quills brown, tipped light, with lightish stems, and barred across inner webs, more obscurely towards their tips; axillaries reddish cream, with reddish-brown spots; under wing whitish cream, with conspicuous bars. Upper tail-coverts greyish white; tail whitish brown, with three broad bars; a fourth, indistinct bar crosses near base of tail."

Obs. This example appears to be a male, as it has a wing of 13·0 inches only, although it is worthy of remark that in some Harriers immature females are sometimes smaller than the other sex. The plumage of the specimen, as described, is much like that of an adult female to be noticed hereafter; and the presence of three "broad bars" on the tail instead of a greater number of narrow ones, as ought to be the case in a young bird, is singular.

Mr. Gurney remarks, in the same article, that "the progress towards maturity is marked in all cases by the spreading of a conspicuous grey tint over the greater and middle wing-coverts, and over the outer webs of the secondaries and of the upper portion of the primaries." This is doubtless the case up to a certain point in the bird's change of plumage; but it appears evident that the entire adult plumage, as is only to be expected in an attire so marked in

its character, is put on at one final moult. Adult males are always to be found in the perfect pied dress without any intermingling of immature characteristics pointing to a gradual assumption of the black-and-white livery. There is, however, much to be learnt concerning the plumage of this species, particularly in respect to the females, and a thorough knowledge of it can only be attained by means of the acquisition of a large series of carefully sexed and dated specimens.

Adult female. The wing, in 10 examples measured by Mr. Hume, varied from 13·7 to 15·1 inches *, and the tarsus from 3·05 to 3·3.

It is a matter of difficulty to determine in this species which type really represents the fully adult female. The following are the dimensions and description of a female shot by myself near Trincomalie, which I have compared with examples in the British Museum, and which Mr. Sharpe considers to be fully mature :—

a. Length to front of cere 17·8 inches ; culmen from cere 0·8 ; wing 14 ; tail 9·5 ; tarsus 3·1 ; mid toe 1·6, claw (straight) 0·67.

Iris citron-yellow ; cere gamboge-yellow ; bill dark horn, bluish at the gape and the base beneath ; legs and feet gamboge-yellow.

Head and upper surface, with the wing-coverts and tertials, a subdued though glossy sepia-brown ; the longer scapulars with a greyish bloom ; the crown-feathers margined with rufous, and the hind neck with dull whitish, not extending to the tips ; edge of forehead, above the eye, and the face whitish ; the lesser coverts, from the shoulder along the flexure of the wing, pure white, with brown mesial stripes, gradually extending over the feathers on the succeeding series ; winglet, primary and greater coverts, shorter primaries, and the secondaries silvery grey, barred with brown, the subterminal band broad, and the tips of the feathers dull white ; longer primaries darker brown, barred with the hue of the tips, and the interspaces of the outer webs greyish ; inner edge of all the quills towards the base white ; upper tail-coverts almost unmarked white ; tail above greyish, with four dark bars, the subterminal one some distance from the tip, which is pale ; the interspaces of the two outer feathers towards the base white, and the bars on that part rufous.

Chin and gorge whitish, striped from the gape round to the ear-coverts with rufous brown ; ruff white, with broad brown central stripes ; under surface and under wing white, the fore neck and chest with bold dashes of brown, almost confluent on the sides of the neck, and diminishing to mesial stripes of a more rufescent hue on the breast, the lower parts having shaft-lines of the same ; lower series of the under wing-coverts with rufescent brown bars, the rest with rufous shaft-lines ; lower surface of tail dull whitish, the bars showing indistinctly.

b. An example in the British Museum, from the collection of Capt. Pinwell, is marked as a female and is in the following plumage :—

Mantle glossy dark clove-brown, much deeper than in the above ; centres of frontal, occipital, and hind-neck feathers blackish brown, those of the first-named parts edged with rufous, of the latter with a paler or fulvescent hue ; the outermost series of greater wing-coverts silvery white, crossed with broad bands of dark clove-brown ; secondaries, shorter primaries, and their coverts of the same ground-colour, with blackish bars ; 1st, 2nd, and 3rd quills with the terminal portions brown, barred with a darker hue on both webs ; internal portion of the inner webs of all the quills white ; tail dusky silvery grey, crossed with five clove-brown bars, those on the lateral feathers gradually changing into rufous.

Sides of the throat, together with the posterior part of face and ear-coverts, rufescent, with dark shaft-stripes ; ruff whitish, striped with dark brown ; chest fulvescent whitish, the feathers with broad rufous-brown centres ; beneath, from the chest pure white, the breast with light rufous-brown stripes, decreasing in width to lines on the abdomen, lower flanks, and under tail-coverts.

Obs. This example differs from the Tamblegam bird in being darker as regards the brown plumage, and paler as regards the grey colouring of the wing-coverts ; while the rufous edgings of the head and throat-feathers are more brought out, which latter characteristic savours of youth, in spite of the apparently more adult coloration of the back and wing-coverts.

It is in much the same dress as an "adult" female described by Mr. Hume in his excellent and exhaustive article already referred to. Another obtained by Col. Godwin-Austin in Assam, and described by Mr. Gurney (Ibis, 1876, p. 130), is darker than either of these—"the entire mantle being blackish brown, increasing in intensity as it approaches the tips of the lower scapulars, which are almost black ; the wings show a remarkable approach to the plumage of the adult male, but the band which extends across the wing-coverts, instead of being black, is dark chocolate-brown, varied by some of the brown feathers passing, in part, into a decided black."

It is probable that each of the above examples were sufficiently mature to breed ; but it does not follow that the darkest birds were the oldest. My bird had the ova developing, and would have bred in the succeeding June, and

* Colonel Godwin-Austen's bird measures, according to Mr. Gurney, 15·8 ('Ibis,' 1876, p. 131).

was in a paler phase than any of the others. It follows, however, from what has been made known by various writers of late, that, as in other Harriers, the female of this species has no fixed character of adult plumage, but that as the bird gradually grows older it inclines towards the melanistic dress of the male, never actually acquiring it, and always retaining the striped under surface peculiar to the sex. The length of tarsus will likewise serve to distinguish an adult female from an immature brown-plumaged male.

Young. Iris "light brownish yellow; cere slaty greenish grey" (*Armstrong*).
Nestling plumage as in young male.

Distribution.—This handsome Harrier, which, in common with the other three species in our list, is a migrant to Ceylon in the cool season, is undoubtedly a rare species in the island. On the few occasions on which it has occurred it has been a straggler no doubt, from the numbers which visit, during the N.E. monsoon, parts of the eastern coast of India and Burmah. Layard, with his usual good fortune, while investigating the ornithology of the island, shot a specimen on the north-west coast near Mantotte, an excellent district for Harriers; he also mentions having seen a drawing of another example made by Mr. Mitford, District Judge at Ratnapura, from a bird brought to him by a native, and captured near that place. In the early part of 1869, I observed a bird in the black-and-white plumage in the cinnamon-gardens at Colombo, and in March 1875 I shot the female above described on the shores of Tamblegam Bay. It is possible that immature birds, in a dress in which they may be mistaken at a distance for other members of the genus, may visit the northern shores of Ceylon; but the old, pied birds can very rarely do so, for during an interval of more than eight years' collecting, always on the look-out for Raptores of all kinds, and two of which were passed in the north of the island, I never succeeded in detecting but the one adult bird above mentioned.

The Pied Harrier is, during the season of its wanderings, more abundant in Assam and Burmah than elsewhere, and radiates outwards from that region down the eastern parts of the Indian peninsula to Ceylon. Mr. James Inglis records it in 'Stray Feathers' (vol. v. p. 11) as extremely common, from September until April, in North-eastern Cachar. Dr. Jerdon writes that it is found in abundance in districts where rice-cultivation is carried on, "as on the Malabar coast, in parts of the Carnatic, and in Mysore," but that it is rare in the Deccan and Central India, though common in Bengal. To the east it spreads from its head quarters, which are evidently the Mongolian territory to the north of Burmah, into China and the Amoor Land, from which regions Mr. Swinhoe records it.

Habits.—The Pied Harrier is said to prefer grassy jungles to swampy land. I have seen it both in marshy places and low scrubby jungle; and the district in which Layard obtained his specimen is one of open plains, studded here and there with clumps of low bushy growth, or dotted with seattered trees. Jerdon says that, in India, it is common in districts which are cultivated with rice; and it therefore does not appear to confine itself to one particular description of country, but, like its congeners, to traverse such open tracts as abound in the food on which it subsists. Being a bird of slender frame and long wing, its flight is particularly easy and graceful: it glides over wide fields impelled by a few slow, though powerful strokes of its ample pinions; and when hunting for its prey it "quarters" a tract of ground with the greatest regularity; starting at one end, it sweeps across from side to side, backwards and forwards, with a graceful turn at the end of its course, and while rising and falling, so as to skim just above the top of the long grass, it is enabled to drop like a stone on its prey.

Its diet consists of small reptiles, lizards, and no doubt small birds, or young ones taken from the nest when its more favourite food is not procurable. It alights and rests on small eminences on the ground, banks, or stones, and roosts, like its congeners, on *terra firma*, thus falling a prey not unfrequently to nocturnal animals. Mr. Oates writes that near Poungday, in Pegu, it is often found on the large plains of mixed jungle and paddy-land, and that it prefers inundated paddy-land to any other.

Nidification.—Where this Harrier breeds is still a matter of conjecture with Indian writers, and consequently nothing is known of its nidification. The late Mr. Swinhoe could obtain no information concerning its nesting in China; and the inference therefore is, that it retires in the breeding-season to the region between the Himalaya and the east of China. Mr. Hume is of opinion that it breeds in part of this district, namely Assam; and Dr. Jerdon remarks that he saw several birds at Purneah in July, at which time they ought to have been nesting somewhere. In the female I killed in March the ova were commencing to develop largely, and she was evidently about to breed at no great date from that time.

CIRCUS CINERACEUS.

(MONTAGU'S HARRIER.)

Falco cineraceus, Mont. Orn. Dict. vol. i. (1802); Temm. Man. i. p. 76 (1820).

Circus cinerarius, Leach, Syst. Cat. Mamm. &c. Brit. Mus. p. 9 (1816).

Circus montagui, Vieill. N. Dict. xxxi. p. 411 (1819).

Circus cinerascens, Steph. Gen. Zool. xiii. p. 41 (1825); Kelaart, Prodromus, Cat. p. 115; Layard, Ann. & Mag. N. H. 1853, xii. p. 105; Schlegel, Vog. Nederl. pls. 18, 19 (1854).

Circus cineraceus, Cuv. Règ. An. i. p. 338 (1829); Gould, B. of Europe, i. pl. 35 (1837); Jerd. B. of Ind. i. p. 97; Gould, B. of Gt. Britain, pt. xii.; Hume, Rough Notes, ii. p. 303; Newt. ed. Yarr. Brit. B. i. p. 138; Holdsworth, P. Z. S. 1872, p. 413; Shelley, B. of Egypt, p. 184; Legge, Ibis, 1875, p. 278.

Circus pygargus, Sharpe, Cat. Birds, i. p. 64 (1874).

The Ash-coloured Harrier, Montagu; *The Ashy Falcon* of Kelaart; *Swamp-Hawk*, Sportsmen in Ceylon.

Rétu ülü, Transylvania. *Cenizo*, Spanish.

Pilli-gedda, Tel.; *Puna-Prāndu*, Tam.

Kurula-goya, *Rajaliya*, Sinhalese.

Adult male (from European, Indian, and Ceylonese examples). Length to front of cere 16·5 to 17·5 inches: culmen from cere 0·69 to 0·71; wing 13·6 to 15·5 (sometimes reaching to the tip or even beyond the tip of tail); tail 8·6 to 10; tarsus 2·2 to 2·3; mid toe 1·1, claw (straight) 0·45; height of bill at cere 0·32 to 0·34.

The following are some measurements of old birds from examples in the British Museum exemplifying the above variation:—

	Wing.	Tail.	Tarsus.
	in.	in.	in.
♂. Bengal	14·9	9·9	2·2
♂. N. Bengal	15·5	10·0	2·3
♂. Seville	13·6	8·6	2·2
♂. Seville	14·2	9·1	2·3

N.B. In this species the second primary-covert does not reach within ¾ inch of the notch in the second primary, falling short of it, in females, by as much as 2¾ inches.

Iris bright yellow; cere, loreal skin, and base of lower mandible yellow, top of cere tinged with greenish; bill blackish at the tip, paling into bluish horn-colour at the base; legs and feet chrome-yellow, claws black.

Head, upper surface, and wing-coverts dark bluish ashen, amalgamating with the paler bluish of the throat, fore neck, and chest, a darkish tint usually prevailing across the back and scapulars; 1st to the 5th primary blackish slate-colour, the rest, together with their coverts, silver greyish with black shafts; secondaries duller silver-grey, crossed by two dark brown bands; upper tail-coverts white, banded broadly with slate-grey; two central tail-feathers slate-grey, the next two paler grey, barred with brown, the remainder with the ground-colour white, more or less tinged with rufous towards the base and barred with dark-edged rufous bands.

Beneath, from the chest, white, striped with narrow streaks of rufous down to the under tail-coverts; axillary plume and under wing-coverts barred with rufous, but not extending to the wing-lining beneath the ulna and carpus. In some examples the ashen hue extends much further down the breast than in others.

Obs. A very remarkable melanistic variety of the adult form exists, some fine examples of which, from Mr. Howard Saunders's collection, are in the British Museum. The whole bird is dark sooty brown, with the cheeks, back,

belly, and lower flanks blackish brown; tail brownish grey; quills and secondaries blackish brown, and the under surface of the tail pale greyish.

Young. The chick is first clothed with white down, which changes in about ten days to fawn-colour on the upper surface; in a fortnight more, according to Mr. H. Saunders's observations, the breast and flanks become clothed with chestnut feathers, and the quills come out blackish brown with a rich rufous border.

Male bird of the year. Wing from 13 to 14 inches; females not exceeding the males at that age.
Iris brownish yellow; cere, bill, and legs much as in the adult.
Above sepia-brown; nape and upper tail-coverts white, the former with the centres of the feathers brown, and the latter with terminal spots and occasionally bars of the same; occiput and hind neck edged with rufous; wing-coverts margined with fulvous; primaries blackish brown, the longer feathers washed on the outer webs with greyish, and the inner webs white towards the base and mottled with brown; tail with the six central feathers brownish grey, barred with brown, the latter becoming broader than the grey ground on the outer of these feathers; the remainder brown, barred with rufescent white.
Cheeks and a broad eye-streak whitish; a gular band of dark rufous-brown, and below it a ruff of paler, dark-centred feathers, *not contrasting*, however, with the band, or *setting it off*, as in *C. macrurus*; chin and gorge rufescent whitish: throat and chest dull brownish rufous, with distinct dark shafts to the feathers, and gradually melting into the yellowish rufous of the breast and lower parts, which are striated with broad stripes of rufous; axillary plume dark rufous, with light marginal spots; median under wing-coverts rufous, with pale margins, the major series brownish.

Obs. The above is a description of *one* example, as presenting a fair type of the young male. The under surface, however, varies much, though it is always darker than that of *C. macrurus*, and differs from that species in the more conspicuously streaked lower parts, as well as in the duller gular band and less conspicuous ruff below it.

Progress towards maturity. The change from this to the adult phase is gradual but *systematic*. The upper surface becomes cinereous brown, the upper tail-coverts sometimes coming out in the adult form (white, with blue-grey bands); the tail becomes grey, the bars vanishing on the central tail-feathers, and the interspaces on the laterals are white in some and rufous-white in others; the chest and fore neck are rufescent, mingled frequently with ashen feathers, and the breast and lower parts pale fulvescent, streaked with rufous stripes; the lower surface of the primaries and the bases of the inner webs are white; under wing-coverts with more white than in the first stage.

After the next moult the lower parts become white with tawny streaks, as in the adult, and the chest is often ashy with cinereous-brown striæ; at the same time the head usually retains its brown dress, and the tail has the lateral feathers as darkly barred and as much tinged with rufous as in the younger stage. The gular band is usually dark brownish, contrasting with the pale whitish ruff assumed at this age.

*Young female**. In the first year, females do not exceed males in size, measuring sometimes quite as low in the wing as the smallest of the latter.
Iris, in some brown, in others yellow, mottled with brown; bill, legs, and feet as in male.
Much resembles the male in plumage, but usually not so dark a rufous beneath, and with the striæ not so strongly pronounced; these are, however, variable in extent, being mostly confined to the chest in some, and extending in others to the lower parts; the primaries are barred on both webs with narrow bands of brown, and the secondaries are crossed on their inner webs with broader bars of the same; the wing-coverts vary, being sometimes almost uniform, and occasionally very deeply edged with rufous, the brown hue being confined to the centre of the feather.

In the next stage the rufous ground-colour of the under surface disappears from the edges of the feathers, and the mesial stripes contrast markedly with the lighter hue of the rest of the web; the head continues to be edged with rufous as before, and the margins of the hind-neck feathers are the same as in the yearling plumage: the upper tail-coverts are scantily barred or pointed with rufous, and the quills more pervaded with ashy than in the first plumage.

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* The adult plumage in this sex varying so much, I have considered it advisable to commence with the young, and follow the changes to the old bird.

The under surface continues to alter until the bird is fully matured; but the adult dress, after it is acquired, varies not a little in different individuals. The following is a description of an example in the British Museum, which, judging by the regular alteration of character during adolescence, appears to be a fully matured bird.

Adult female. Above sepia-brown, pervaded on the back with greyish; the head margined with rufous, and the hind neck with fulvous, the centres of the feathers being blackish brown; median wing-coverts broadly margined with rufous-buff as in the younger bird; terminal portion of primaries and the secondaries deep brown, with a purple lustre; the outer webs of the longer primaries greyish, and both webs barred with narrow bands of blackish brown; inner webs near the base isabelline grey; upper tail-coverts white, with greyish-brown bars near the tips of the longer feathers; central tail-feathers drab-grey, with four narrow bars and a broad subterminal band of deep brown, the remainder crossed with the same number of wider bands, the interspaces paling to white on the lateral feathers, where the bars are narrower again, and tinged with rufous at the base.

Face and a small space above the ears white; the gular band deep brown, margined with rufous and tinged with ashy; ruff blending with the throat and fore neck, which are rufescent, with broad cinereous-brown stripes; beneath, from the chest downwards, fulvescent whitish, with bold central stripes of rufous-brown on the chest, and of rufous on the lower parts; under wing-coverts rufescent white, boldly dashed with rufous; edge of wing-lining whitish.

Soft parts as in the adult male.

Length* to front of cere 18·5 inches, culmen 0·7; wing 14·0 to 15·3; tail 10·0; tarsus 2·3; mid toe 1·15, claw (straight) 0·58; expanse 43·0.

The following are measurements of several European and Indian examples of adult females, which are all exceeded by those of a male from N. Bengal:—

Wing.	Tail.	Tarsus.
in.	in.	in.
14·3	9·1	2·5
14·3	9·0	2·4
14·6	9·0	2·4
14·6	9·5	2·3

Distribution.—This widely dispersed Harrier is, as might be expected, a winter or cool-weather visitant to India and Ceylon, arriving in the latter place about October and departing again in April. After concentrating itself in considerable force in the Jaffna peninsula, the adjacent isles, and on the coast of the Northern Province, it spreads down both sides of the island, but does not apparently wander into the interior after the manner of the last species. On the west coast it is chiefly confined to such open localities as the cinnamon-gardens of Negombo, Colombo, Morotuwa, &c., and likewise affects the almost inpenetrable swamp called the Mutturajawella. In the Galle district it never came under my notice as an identified bird, but may have figured among the many observed on the wing between the port and Baddegama; in the south-east, however, it occurs, but not so frequently as in the north. During a visit, in March 1876, to Jaffna and the neighbourhood, I found it at several islands in Palk's Straits, among which were the twin islets of Erinativoe, on which several were seen in the course of a day's excursion. In the island of Manaar and at Aripu I likewise observed and procured it.

Montagu's Harrier has a very similar geographical range to the next species. In Europe it is perhaps more generally distributed, as it extends in the summer to the British Isles, and is also common in Spain, but chiefly during the winter, whereas the Pale Harrier does not move westward of 8° E. long. It does not confine itself to the south of the continent alone, for it has been recorded from both Heligoland and Sardinia. It is found in Scandinavia, but does not appear to range into Northern Russia, although it inhabits the south of that country. From the Caucasus it extends, like the last bird, through Palestine, to the elevated region of Turkestan, from which Severtzoff records it. It is abundant in India in the cool season; but though Jerdon remarks that he found it in all parts of the empire, the experience of recent observers, as appearing in 'Stray Feathers,' tends to show that it is more local than either the Marsh- or the Pale Harrier. Mr. Hume does not record it from Sindh, and Mr. Ball states that it is not common in Chota Nagpur. In the Deccan, Mr. Fairbank says it is common; and it occurs, but not abundantly, in the Khandala district. It is found in Burmah, and has been obtained as far east as the Yangtsze river in China.

* From the flesh in Ceylonese examples.

Habits.—Montagu's Harrier delights in swamps, marshes, and open country, more or less studded with low jungle and copse, over which it sweeps at a considerable height, rising and falling in its rapid progress, and appearing to take in a more extended view of its ground than the Pale Harrier can do in its low-directed flight. I have seen it, however, in the great swamp of Mutturajawella, flying steadily from end to end, with a slow beating of its long wings, keeping just above the tangled vegetation, and now and then dropping out of sight in the sudden manner peculiar to its family. It is crepuscular in its habits, flying about its hunting-grounds so late that it cannot be discerned when a little way off; and sharp indeed must be its eyesight to enable it to capture the small prey that it lives on, among grass and herbage, with so little light. Layard, whose observations tended to show that it fed much upon snakes, has the following well-written description of its flight in the Ann. & Mag. Nat. Hist.:—"Nothing can exceed in gracefulness the flight of this bird when beating over the ground in search of its quarry. Its long pointed wings smoothly and silently cut the air; now raised high over its back, as the bird glides along the furrows; now drawn to its sides, as it darts rapidly between the rows of standing paddy; now the wings beat the air with long and even strokes, and now extended, they support their possessor in his survey of the marsh over which he is passing. Suddenly he drops, and after a momentary halt speeds away, with a snake dangling in his talons, to some well-remembered stone or clod of earth, and commences his repast."

I have found the bones of small mammals, probably mice, as well as grasshoppers in this Harrier's stomach; but in Ceylon, according to my experience, its chief food consists of lizards. In countries where reptiles do not abound, such as England and other parts of Europe, it preys to a certain extent on small birds; and Mr. Howard Saunders, in his very interesting account of the nesting of this Harrier in the Isle of Wight, published in the 'Field' of the 2nd September, 1875, found amongst the food brought to the young in the nest, "the remains of several small birds—skylark, titlark, stonechat, and yellow hammer." It will also kill snakes, as appears from the above extract from Layard's writings, and no doubt very frequently preys on them in the fetid swamps of the East. Professor Newton, in his edition of Yarrell, speaks of one "which was observed to hover about a trap, baited with a rabbit, without pouncing, but on a viper being substituted for the rabbit, the bird was immediately caught." The same writer likewise speaks of its swallowing birds' eggs whole.

Montagu's Harrier, like the Moor-Buzzard, seems to prefer perching on level ground to settling on little knolls and elevations. It roosts also on the ground, and is probably often captured in the East by the stealthy jackal, or in northern climes by the still more clever fox. This Harrier does not appear to have strong powers of vision, when they are subjected to the force of the sun's rays. I once observed three birds alight, one after the other, on the bare soil, and stand with erect carriage, all looking in the same direction, after the manner of Gulls; and being between their position and the rays of the setting sun, I appeared not to be noticed by them, for I was enabled to creep steadily forward towards them in the open, and thus secured, from among the trio, one of the finest female specimens in my collection.

I have heard this Harrier make a weak squealing note, but can say nothing further as to its voice; in fact the Harriers, as a group, seem to be among the most silent of raptorial birds, little or nothing concerning their notes having been placed on record by the numerous observers of their otherwise interesting habits. When viewed on a glorious tropical morning, there is something very striking in the noiseless course of this and other Harriers as they glide silently over the misty paddy-swamps of the interior, while the luxuriant forest surrounding these, to the lover of nature, most interesting spots re-echoes with the voice of hundreds of the smaller bird creation.

This species thrives in confinement; and Mr. Saunders, in his article above referred to, records that the young bird in question, when it had acquired the free use of its wings, flew "round the lumber-room in which it had been placed in a buoyant manner, and took great pleasure in a bath, in which it would stand knee deep, enjoying being sprinkled with water, after which it would spread its wings and bask in the sun."

Nidification.—The Ashy Harrier does not breed within the Indian limits, but in northern climes, where it propagates its species, it nests in May and June. In Europe and Great Britain its nest is built, as elsewhere, on the ground, and is made of small sticks, rushes, grass, roots, &c., the latter composing the interior or lining. It is more slightly built, as a rule, than the nests of other Harriers; but its size must necessarily depend on the

situation in which it is placed, for if this should be in damp ground, where the water is liable to rise, instinct teaches the bird to raise the body of the nest until above the level at which its eggs might be destroyed. In 'The Ibis,' 1875, Messrs. Danford and Harvie Brown remark that at Mezöség, in Transylvania, they "found them nesting among reeds, the nest being sometimes considerably above the ground." The nest found by Mr. Saunders in the Isle of Wight was a "mere bottom, lined with dry grass, with an outside border of fine heather-twigs." The eggs are four to six in number, generally white and unspotted, but sometimes bluish white; the specimen figured by Mr. Hewitson is of a very pale blue: they measure 1·72 to 1·51 inch in length by 1·39 to 1·25 in breadth.

While sitting, the female is said by some writers to be attended by the male, who brings food to her; but I note that Mr. Saunders writes that, in the course of many hours' watching at different times, he "never observed the male approach the nest as if to bring food or take his turn at incubation." It is possible, however, that some birds display different propensities to others. I conclude this article with quoting still further from the interesting account of the nesting of this species in the Isle of Wight, as touching one of the most interesting features in a bird's economy, viz. its manner of returning to its nest in order not to betray its whereabouts. The writer remarks as follows:—"It was most interesting to watch the movements of the Harrier when returning to her nest; the wide circles which enabled her to take in the position of any large object on the downs gradually narrowed; then quartering would begin again, to be succeeded by more circles, till every one might be expected to be the last. Then, perhaps, she would change her mind, and go off for another series of wide flights; but when the moment came there was no hesitation or hovering, but a sudden closing of the wings as she swept over the spot, and she was down in so stealthy a manner, that if the eye were taken off her for a second, it was impossible to say whether she had settled or merely gone over the brow of the hill again."

CIRCUS MACRURUS.

(THE PALE HARRIER.)

Accipiter macrourus, S. G. Gmelin, N. Comm. Petrop. xv. p. 439, pls. viii. & ix. (1771).

Circus swainsonii, Smith, S. Afr. Q. Journ. i. p. 384 (1830); Gray, Gen. B. i. p. 32; Kelaart's Prodromus, Cat. p. 114; Layard, Ann. & Mag. N. H. 1853, xii. p. 104; Jerdon, Birds of Ind. i. p. 96; Hume, Rough Notes, ii. p. 298; Holdsworth, P. Z. S. 1872, p. 413; Legge, Ibis, 1874, p. 10, et 1875, p. 278; Dresser, Ibis, 1875, p. 109 (Severtzoff's Fauna of Turkestan).

Falco herbæcola, Tickell, J. A. S. B. 1833, p. 570.

Circus pallidus, Sykes, P. Z. S. 1832, p. 80; Gould, B. of Europe, i. pl. 34; Hume, Stray Feath. i. p. 160.

Circus macrurus, Sharpe, Cat. Birds, i. p. 67 (1874).

The Pallid Harrier of some writers; *Swainson's Harrier* of others.

Pale-chested Harrier in India.

White Hawk, *Paddy-field Hawk*, in Ceylon.

Dastmal, Hind.; *Puna-Prāndu*, Tam., lit. "Cat-Kite;" *Pilli-gedda*, Tel., also "Cat-Kite."

Boz-Sā, Turkestan, lit. "Grey Kite."

Kurula-goya, *Ukussa*, Sinhalese.

Adult male. Length to front of cere 17·0 to 17·8 inches; culmen from cere 0·72; wing 13 to 14, averaging about 13·7; expanse 42; tail 9·0 to 9·5, exceeding the closed wings from 1·5 to 3·0; tarsus 2·5 to 2·8; middle toe 1·2 to 1·3, claw (straight) 0·6 to 0·65; height of bill at cere 0·38.

Female. Wing from 14·2 to 14·9 inches, averaging about 14·6.

Male. Iris golden yellow, very rich in the oldest birds; cere yellow, tinged with green above; gape greenish yellow; bill blackish at top, paling to blue at cere: legs and feet chrome-yellow; claws black.

Head and entire upper surface, including the wing-coverts, bluish ashy, the upper tail-coverts barred with white; in most examples, except the very oldest, there is a brownish wash on the nape and mantle; primaries ashy grey, the 3rd, 4th, and 5th more or less black, according to age, from the notch to the tip, and white from that part along the inner web to the base; secondaries ashy grey, tipped pale, and with their inner edges white; tail pale grey, the three lateral feathers white, and all but the central pair banded with narrow grey bars; forehead and an ill-defined supercilium, chin, throat, under surface of body, and wings pure white; throat, sides of neck, and chest very pale bluish grey, blending into the white of the lower parts, and with the shafts darker than the webs; cheeks faintly striated with grey.

Young male. Wing in the first year varying from 12·8 to 14·0 inches, quite equal to the adult.

Iris greenish, or less bright yellow than in the adult; cere and eyelid greenish yellow; bill blackish horn-colour, bluish near the cere; legs and feet citron-yellow.

Above chocolate-brown, with an angular white nuchal patch, and with the upper tail-coverts white, with terminal rufous-brown spots; the entire upper surface edged with rufous, narrowly on the head, more broadly on the hind neck and lesser wing-coverts, and on the back and scapulars confined chiefly to the tips of the feathers; quills brown, the inner webs barred with darker colour, and the interspaces from the notch upwards buff; a grey wash on the outer webs of the primaries, and the tips, as well as those of the secondaries, pale fulvous; tail drab-brown on the centre feathers, changing on the three laterals to buff, the tip buffy white, and the whole, with the exception

of the outer feather, crossed by 4 or 5 bars of dark brown; a narrow supercilium and a patch below the eye whitish; lores brown; a broad brown gular band succeeded by a fulvous, dark-striped ruff; under surface with the under wing pale uniform rufescent, the shafts of the feathers slightly darker rufous.

Between this and the adult grey stage birds are found in great variety of change to the pale plumage; after the first moult they become ashen brown above, with generally some rufous feathers about the nape; the upper tail-coverts become barred with greyish brown, the central tail-feathers ashy, the three lateral ones whitish, barred with rufous-brown; the quills pale ashy brown at the base; the long primaries black on the terminal half, with their inner edges whitish; the facial markings become very pale, the throat, fore neck, and chest bluish ashy, the ruff with darkish streaks, and the chest striated with pale brown; beneath, very pale bluish ashy in some, quite white in others, many specimens, likewise, having rufous shaft-stripes, while others are completely unmarked; the under tail-coverts pure white. It is in the chest and under surface that the greatest variation takes place.

In an example from the Deccan in the British Museum, in the ashen-brown upper plumage of the second year, the entire under surface from the chin, including the under wing-coverts, is *pure white*, with a few shaft-lines of rufous on the chest and throat; the tail almost as pale as in the oldest specimens; the basal part of the web of the inner primary webs partakes of the same albescent character as the under surface, being quite white.

Young female. Wing in the first year averaging about 13·5 inches, but frequently no longer than that of young males. Differs from the young male in being usually of a deeper brown, the wing-coverts very broadly edged with rufous, the upper tail-coverts with brown mesial *stripes*, and the under surface *much darker, of a rich uniform rufous tawny*; the gular band of a very dark brown, *contrasting strongly* with the whitish cheek-patch. The white nuchal patch varies, but is, I think, stronger, as a rule, than in the young male.

Progress towards maturity. In the next stage, the upper surface loses the conspicuous character of the edgings; the head and hind neck contrast with the back, the latter becoming paler; the cheeks and gular band remain the same; but the under surface undergoes a gradual change, commencing with the fading out of the rufous, particularly on the lower parts, leaving this colour confined to the centre of tho feather, the fore neck and chest being heavily streaked, and the lower breast and flanks lightly so.

The lower parts continue to pale with age until, in the oldest birds I have been able to examine in a large series, they become fulvescent white, and are, with the under tail-coverts, unmarked, save with a few light streaks of pale rufescent; the throat is marked with brownish mesial lines in such examples, and the fore neck and chest with dark brownish streaks on a rufescent ground; the ruff is greyish, with darker longitudinal spots; the upper parts are glossy cinereous brown, and the wing-coverts rather darker brown, the broad fulvescent yellow edgings showing more conspicuously even than in young birds; the nape is light, and the feathers of the head and hind neck edged with rufous; the scapulars and tertials are tipped with a paler hue; the central tail-feathers are ashen grey, with six brown bars, the ground-colour of the three lateral feathers remaining buff; the forehead and eye-streak are whitish, and the gular patch greyish brown.

Obs. This species may be distinguished at all ages from *C. cinerarius* by its having the tip of the second primary-covert reaching to, or even overlapping, the notch on the second primary, by its closed wings not reaching within 1·3 inch of the tip of the tail, and sometimes falling short of it by 3 inches, and by its longer middle toe, this latter not exceeding 1·1 inch in the last species. In addition to these characteristics, the young, in which alone mistakes are likely to be made, may be recognized at a glance from *C. cinerarius* by the lighter-coloured ruff contrasting with the dark cheek- and ear-patch.

Distribution.—This handsome Harrier visits Ceylon, on its southward migration through India, about the commencement of October, and spreads in considerable numbers over the whole island, including the mountain-zone to its highest parts. Unlike its congeners, however, it remains behind in the island to a limited extent, those which do not leave being young birds, and they confine themselves in the wet season to the upper regions and the north coasts. Mr. Holdsworth has seen them in Nuwara Elliya in July and August, and I have met with specimens shot at the Elephant plains about the same time. I cannot but think, however, that such occurrences are rare exceptions, its remaining in Ceylon at this season being a most remarkable feature in this Harrier's economy. Mr. Holdsworth is an authority for its existence, out of season, in the north, as he observed it at Aripo throughout the year. On the opposite side of the island it is not seen during the S.W. monsoon; and I imagine that it is limited at that time to the north-west coast, on the plains of which, both species, this and the last, abound, attracted thither, no doubt, by the myriads of lizards which overrun these open wastes.

Besides the above locality, in the north, I have found the Pale Harrier numerous in the Jaffna peninsula and adjacent islands, at Manaar in the open pasture-lands and plains, in the great delta of the Mahawelliganga, and on the south bank of the Virgel, along the seaboard of the Eastern Province, and about the salt lakes or "leways"* of the Hambantota district. In the Western Province it is mostly confined to the paddy-lands and the marshes, round the large brackish lakes on the sea-coast, but in the northern half of the island it is found at all the large tanks of the interior. In the Kandyan Province it frequents the patna-hills and "plains" of the upper ranges, wanders over the open country in the coffee-districts, and is not unfrequently found in Dumbara.

The Pale Harrier is a bird of wide geographical range during the cold season of the northern hemisphere; and though it perhaps does not cover as much ground as its near ally the Hen-Harrier, its southern limits are more extended. It is common in some parts of Europe, and absent from other portions of that continent, not visiting, for instance, the British Isles. Lord Lilford does not seem to have noticed it in Spain, and Messrs. Harvie Brown and Danford found it rare in Transylvania. In the small island of Heligoland Mr. Gätke records its occurrence. From Europe it extends southwards through Egypt and Eastern Africa to Cape Colony, and eastwards through Palestine, where Canon Tristram found it common, to Persia and Turkestan, in which latter highland Mr. Severtzoff and Dr. Scully observed it. Throughout India it is more or less abundant in the cold season, extending into Burmah and thence into China, where it has been procured on the Yangtsze river. In the peninsula of India it does not appear to remain in the breeding-season, Messrs. Adam, Butler, Ball, and others recording it only during the cool weather; and this makes its occurrence in Ceylon, the most southerly limit of its range, all the more strange during the south-west monsoon.

Habits.—Swainson's Harrier does not frequent openly-timbered plains or scrubby land, the favourite haunts of the last species, so much as swamps, marshes, rice-fields, and pasture-land, more particularly those in the vicinity of water. It passes most of its time on the wing, and rarely perches on any thing higher than a fence, preferring to rest from its labours on *terra firma*. Few, if any, of the Harriers exceed it in grace and ease of movement, and none are so skilful in sailing along close to the ground, or gliding with motionless wings just above the tops of the reeds or long swamp-grass. On espying its prey it suddenly closes its wings, or makes a quick turn, and drops like a stone upon the ground. By the margin of the extensive salt lakes on the Magam Pattu I have witnessed its powers of flight to great advantage. It would suddenly come into view above the top of the surrounding jungle, and sweep instantly down to the surface of the plain, along which it would skim for several hundred yards without any movement of its wings, and as easily rise over an intervening strip of wood, again to descend with rapid swoop, and glide along the shore of the glistening salt-pan, until, with a sudden but easy turn, it would commence to quarter backwards and forwards in search of food. Its favourite diet consists of the lizards (*Calotes*) which swarm on the open land in Ceylon; but it likewise captures mice in long grass, and frogs or beetles in the marshes which it frequents.

I once shot one at Jaffna in the act of swooping down on a wounded Gull-billed Tern; but its movement was most likely one of curiosity, as it would have had some difficulty in disposing of such large quarry. It must nevertheless frequently have the opportunity of picking up wounded or sickly birds of small size. It roosts on the ground; and Jerdon remarks that it is sometimes surprised at night by a jackal or fox. It has the same silent habit as other Harriers.

Nidification.—It has been clearly ascertained that this species does not breed within the limits of the Indian empire, in which very few specimens are seen after the month of April; and this fact renders its remaining in Ceylon during its regular nesting-season all the more singular. The birds that frequent the Indian region may no doubt breed in Kasgharia or in the steppes of Siberia; but I do not observe any account of its nidification in the writings of those who have visited the Central-Asian region. Its only known breeding-haunts are the steppes of South-eastern Russia, whence Dr. Bree figures two interesting specimens of its eggs in his 'Birds of Europe.' These are:—(1) pure white, unspotted; (2) white, with a few pale reddish blotches of moderate size, some of which are confluent round the small end. They measure 1·75 by 1·3 inch, and 1·8 by 1·35 inch. The nest is placed most likely on the ground among bushes and the stunted growth dotting the barren Russian steppes.

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* Shallow lagoons in which the annual salt formations take place.

ACCIPITRES.

FALCONIDÆ.

ACCIPITRINÆ.

Genus ASTUR.

Bill stouter than in the last genus, with the culmen not descending so suddenly from the base; festoon tolerably pronounced; cere large; nostrils oval, unprotected by bristles; lores scantily plumed. Wings short and rounded, the 4th and 5th quills subequal and longest, the first a little longer than half the fifth. Tarsus short, moderately stout, covered in front and behind with large transverse scutæ, or with a smooth plate in front as in the subgenus *Scelospizias*. Toes short, the inner toe reaching to the last joint of the middle one, the outer one slightly longer; claws well curved and acute.

ASTUR TRIVIRGATUS.

(THE CRESTED GOSHAWK.)

Falco trivirgatus, Temm. Pl. Col. i. pl. 303 (1824).

Astur trivirgatus, Cuv. Règ. An. i. p. 332 (1829); Gray, Gen. B. i. p. 27; Kelaart's Prodromus, Cat. p. 105; Layard, Ann. & Mag. N. H. 1853, xii. p. 104; Jerdon, B. of Ind. i. p. 47; Schl. Mus. P.-B. *Astures*, p. 22; id. Vog. Nederl. Ind., Valkv. pp. 18, 57, pl. 10; Holdsworth, P. Z. S. 1872, p. 410; Sharpe, Cat. Birds, i. p. 105 (1874).

Astur palumbarius, Jerd. Madr. Journ. x. p. 85 (1839).

Lophospizia trivirgatus, Hume, Rough Notes, i. p. 116; Gurney, Ibis, 1875, p. 35.

Lophospiza trivirgata, David & Oustalet, Ois. de la Chine, p. 22 (1877).

Sparrow-Hawk, Europeans in Ceylon.

Three-streaked Kestrel, Kelaart.

Gor-Besra, H., lit. "Mountain Besra;" *Kokila dega*, Tel., lit. "Cuckoo Hawk" (*apud* Jerdon).

Ukussa, Sinhalese.

Adult male. Length to front of cere 14·25 to 14·8 inches; culmen from cere 0·7 to 0·78; wing 7·5 to 8·3; tail 6·25 to 7·0; tarsus 2·0 to 2·2; mid toe 1·1 to 1·2, its claw (straight) 0·5 to 0·58; hind claw (straight) 0·77; height of bill at cere 0·45.

Adult female. Length to front of cere 14·8 to 15·0 inches; culmen from cere 0·8; wing 8·0 to 8·5; tail 6·5 to 7·2; tarsus 2·2 to 2·4; mid toe 1·35, claw (straight) 0·6; hind claw 0·85.

Obs. The above measurements are from a series of Ceylonese and Indian birds, including several examples from Malacca. Some birds from Malaya (Borneo, for instance) have the wing more than 9 inches in the female.

Iris golden yellow, in some examples beautifully pencilled with brown at the exterior edge; cere, gape, and eyelid greenish yellow, in some yellow; bill dark bluish brown, pale at the base, and with the tip blackish; legs and feet sickly or, sometimes, gamboge-yellow.

Hind neck, back, and wings glossy brown, in some old specimens with an ashen hue pervading these parts; forehead, crown, nape, crest, and face cinereous brown, generally with an ashen hue, particularly above and behind the eye; the crest, which is usually from $1\frac{1}{4}$ to $1\frac{1}{2}$ inch in length, springs from the nape; upper tail-coverts deep brown, with the longer feathers broadly tipped with white; primaries and secondaries barred with dark brown, the under surface of the brown interspaces whitish; tail light drab-brown above and pale grey below, with a pale tip and four dark-brown bars; in the female there is usually a fifth bar concealed beneath the coverts.

Chin, throat, and under surface, from the chest downwards, white; a bold dark-brown chin-stripe, and the lower edge of the cheeks equally dark, generally forming a gular stripe; chest brownish rufous, the centres of many of the feathers darker than the edges; breast and flanks rather closely barred with deep brown; the thighs more closely barred with narrower bands of the same; under tail-coverts, in the female, with a few terminal bars of brown; under wing-coverts white, spotted with brown.

In a younger but still mature phase (in which I have found birds paired) the feathers of the lower part of the throat and centre of chest have broad white edges and bold central drops of dark brown, which pale off into rufous towards the sides of the chest, and there spread over the entire feather; the breast and flanks openly barred with broad bands of sepia-brown, and the thighs narrowly barred, generally, with a darker hue. This appears to be the commonest phase of what may be called the mature dress, the uniform-chested birds being rarely met with.

Young. Iris greenish yellow, sometimes mottled with brown; cere and eyelid greener than in the adult; legs and feet greenish yellow.

The nestling in first plumage is light smoky brown above, the bases and edges of the feathers very pale; head and crest very dark, the bases of the feathers tawny; quills barred much as in the adult, but the inner edges and interspaces white, shaded with tawny grey; tips of the secondaries and their coverts and those of the upper tail-coverts pale; tail light drab-brown, with either three or four visible bars across the centre, and an additional one at the base of the two lateral feathers; beneath white (some examples are much coloured with a rufous hue), the fore neck and chest boldly streaked with dark brown, and the rest marked with oval, lighter brown spots; thigh-coverts *barred* with darker brown than the breast-spots.

The change towards the adult dress takes place by the darkening of the upper surface and the tips of the upper tail-coverts gradually becoming whiter; the sides of the chest at the same time become uniform rufous-brown, this colour spreading by degrees over the entire feather, except at the inner edge; the breast and flank-markings turn into bars, at first broad and far between, and then narrower, darker, and closer together.

Obs. The larger Nepal race, originally described as *Spizaëtus rufitinctus* by M'Clelland, has the wing varying, according to Mr. Hume, from 9·3 to 10·6 inches, while Jerdon gives that of a female as 11·5. Several examples I have measured in the British Museum exceed 10, and differ in the character of their plumage as well. Mr. Sharpe now considers this a good species, and Mr. Hume has always accepted it as such. Above, these birds are a more ruddy brown than the smaller species; there is no ashy tint; the upper tail-coverts and tail are tipped with a more subdued colour; the neck and chest are marked with very broad rufescent brown drops on a buff-white ground, and the markings of the under surface have a more rufescent character than in the small bird. Some Malayan specimens of the latter race which I have examined exhibit a marked similitude to these Himalayan birds in their coloration; and on the whole the South-Indian and Ceylonese races are the darkest, and more nearly resemble each other than those from any other two localities. The Formosan bird is evidently a larger race than ours, as Mr. Swinhoe records a female with a wing of 9·0 (Ibis, 1866, p. 395).

Distribution.—The Crested Goshawk is widely dispersed through the low country, inhabiting those parts which are covered with forest or heavy jungle. It is found pretty generally all through the jungles to the north of the Deduru Oya; but I do not think it occurs in the Jaffna peninsula. In the wilds of the Eastern Province, and the thickly wooded country to the south of Haputale, it is tolerably frequent, but difficult of observation on account of its sylvan propensities. It is liable to be met with in most of the isolated forests or reserves in the Western Province, such as the Ambepussa Hills, the Ikkade Barawe forest near Hanwella, but chiefly, according to my own observations, during the north-east monsoon; the same may be said of the south-western corner of the island, where, from November until May, I have known it to occur about Amblangoda, Baddegama, and as near Galle as the Government reserve at Kottowe. Further inland, in

the jungles of the Pasdun Korale and the district of Saffragam, it is doubtless resident and breeds. In the Peak Forests it is likewise not uncommon. As regards its range into the mountain-zone I do not know of its having been found above 3500 feet. About the neighbourhood of Kandy, and at Nilambe and Deltota, it is frequently shot, there being in general one or two examples in Messrs. Whyte and Co.'s establishment.

The *Gor-Besra*, as it is called in India, is spread over the peninsular portion of the empire, inhabiting the Nilghiris perhaps more commonly than other wooded regions. It does not appear to be an abundant species, as but few instances of its occurrence are recorded in 'Stray Feathers,' whereas frequent mention is made of its northern ally from the Himalayas, Nepal, Kumaon, and Assam. Our bird appears to be found in Pegu, as it is included in Mr. Oates's list, and to the south-east of Burmah it seems to have a very extended range, inhabiting Malacca, Java, Sumatra, portions of Borneo and the Philippine Islands, together with Formosa. From the island of Sumatra it seems to have been first known, Cuvier giving that island as its sole habitat. It does not extend eastwards from Burmah towards China, which is a singular feature in its distribution, seeing that it has such an extensive south-easterly range. Père David did not meet with it anywhere in the latter country; nor did Mr. Swinhoe in all his experience on the coast of the Celestial Empire.

Habits.—This bold bird is almost entirely a denizen of the forest, in the tallest trees of which I have usually met with it, giving out its shrill monosyllabic scream (or, more properly speaking, whistle) as a call-note, perhaps, to its mate, or in defiance of the group of small birds which very frequently are found haranguing it at a respectful distance. In this latter respect it much resembles its smaller cousin, the Besra (*Accipiter virgatus*); for I have more than once found it surrounded by a host of angry White-eyebrowed and Forest Bulbuls*, accompanied by one or two equally energetic Kingcrows, darting and flying round in the highest state of excitement, while the Goshawk, with an air of injured innocence, sat stolidly on the capacious limb of some enormous Koombook tree, screaming at its tormentors to the utmost of its powers. This habit of the small birds, I must here state, carries with it some amount of injustice; for though this hawk is frequently given a bad character for not respecting the life of his feathered friends, and appropriating for his larder sundry small chickens, pigeons, and that ilk, I have invariably found his food to consist of lizards, to none of which is he so partial as to the Green Calotes (*Calotes viridis*). I have shot him in the forests of the Vanni, screaming with delight over a brilliantly green Lizard which hung, pinned by his talons, to a branch, while his stomach was crammed with just such another. Layard, in his 'Notes on Ceylon Ornithology,' says that it swoops down to the poultry-yard from "some towering tree or butting rock, and, despite the fury and resistance of the faithful mother, rendered fiercer by despair, the foe generally carries off one, if not two, of her family."

Jerdon also remarks, in the 'Birds of India,' that "it is not very rare in the Neilgherries, and occasionally commits depredations on pigeons and chickens, making a pounce on them from a considerable height. It generally keeps to the woods or their skirts, dashing on birds sometimes from a perch on a tree, but generally circling over the woods, and making a sudden pounce on any suitable prey that offers itself."

Layard says that they are used by native falconers in Ceylon for hunting, and mentions that he saw one at Anaradjapura, which had been hoodwinked by having its eyelids sewn up, "the thread running through them so as to draw the edges together at pleasure." I have seldom seen it fly any distance, nor observed it far away from the outskirts of woods; but its progression from point to point in the forest is swift and performed with quick beatings of the wings.

It was formerly, according to Jerdon, used for falconry in India, and was taught to strike Partridges.

Nidification.—The nest of the Crested Goshawk does not appear to have ever been found. Mr. Hume has not succeeded in eliciting any information from his numerous correspondents concerning its nidification; and all we know concerning its breeding is what Layard tells us—that it nests in the "holes and crevices of precipitous rocks."

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* *Ixus luteolus* and *Criniger ictericus.*

ASTUR BADIUS.

(THE INDIAN GOSHAWK.)

Falco badius, Gm. S. N. i. p. 280 (1788).

Accipiter dukhunensis, Sykes, P. Z. S. 1832, p. 79.

Accipiter badius, Strickl. Ann. N. H. xiii. p. 33 (1844); Kelaart's Prodromus, Cat. p. 115; Layard, Ann. & Mag. N. H. 1853, xii. p. 104.

Micronisus badius, Bp. Consp. i. p. 33; Jerdon, B. of Ind. i. p. 48; Hume, Rough Notes, i. p. 117; Holdsworth, P. Z. S. 1872, p. 411; Hume, Nests and Eggs, i. p. 24; Legge, Ibis, 1875, p. 276.

Astur badius, Sharpe, Cat. Birds, i. p. 109 (1874); David and Oustalet, Ois. de la Chine, p. 24.

Scelospizias badius, Gurney, Ibis, 1875, p. 360.

The Brown Hawk, Brown, Ill. Zool. p. 6, pl. 3 (1776).

The Shikra, Jerdon. *Indian Sparrow-Hawk*, popularly in India.

Shikra (female), *Chipka* (male), Hind.; *Chinna-Wallur*, Tam. (*apud* Jerdon).

Brown's Sparrow-Hawk, Kelaart.

Ukussa, Sinhalese south of Ceylon; *Kurula-goya* in north.

Adult male. Length to front of cere 11·5 to 12·8 inches; culmen from cere 0·6 to 0·63; wing 6·9 to 7·9; tail 5·5 to 6·2; tarsus 1·75 to 1·9; middle toe 1·0 to 1·12, its claw (straight) 0·4 to 0·45; hind toe 0·6, its claw (straight) 0·6; height of bill at cere 0·34 to 0·36.

The largest examples do not equal those from Northern India; the average length of wing of Ceylonese birds is about 7·3.

Iris usually light crimson or orange-red, in very old examples fine crimson; cere and orbitar skin greenish yellow, the top of the generally greenish bill bluish, darkening at the tip; tarsi and feet yellow, the front of the tarsus streaked with greenish.

Above bluish ashy, palest on the rump and upper tail-coverts: top of the head and the nape shaded with brownish, and a ruddy tinge generally on the hind neck; quills ashy brown, the inner webs for two thirds of their length from the base edged and barred with white, the brown interspaces being darker than the rest of the feather: beyond the notch there are indications of darkish bars; tertials and scapulars with a large concealed white patch down their centres; tail bluish grey, tipped with whitish; central feathers unbarred, but slightly darker towards the tip; the outer feathers with faint brown bars towards the base of the inner web, the next with five bars on the same web: the two adjacent with four, which sometimes extend to the outer web; the barring of the outer tail-feathers varies in extent even in birds which are similarly pale throughout their plumage; lores greyish; chin and gorge white; cheeks, ear-coverts, and a narrow chin-stripe cinereous grey; chest, breast, and flanks pale sienna-colour, narrowly barred with white, which in no two specimens is alike*, being in some open and in others very close, particularly on the chest; belly, thighs, and under tail-coverts, with the sides of the upper coverts, white, the bars gradually fading out on the lower breast; under wing and lower surface of quills rufescent white.

In a slightly younger stage of the adult plumage the upper surface is darker and pervaded with a cinereous hue; the bars on the inner web of the outer tail-feather extend nearly to the tip, and on the adjacent one there are as many as in the young bird.

Adult female. Length to front of cere 12·6 to 13·8; culmen from cere 0·63 to 0·65; wing 7·7 to 8·2; tail 6·5 to 6·8; tarsus 2·0 to 2·2; mid toe 1·25.

Females, except perhaps those that are very old, are browner on the upper surface than males; the barring of the under

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* In one remarkable specimen from Uva the entire under surface, from the throat to the lower breast, is openly barred, the width of the white bands being the same throughout.

surface is bolder, and the brown bands have a more perceptible dark edging; they are also variable in hue, and are continued more to the lower parts than in the other sex, some examples having the thigh-coverts barred like the flanks; the outer tail-feathers, as demonstrated by Ceylonese examples at any rate, are seldom without very narrow bars on the inner webs.

Obs. A very marked difference exists between fully-aged birds and those that have just assumed the barred phase; in the latter the upper surface is very brown, and the bands of the lower surface are far apart and conspicuously edged with brown, giving the whole an umber rather than a sienna appearance. In this stage Ceylonese examples of this Hawk resemble, on their under surface, the race characterized by Mr. Hume, in 'Stray Feathers' (vol. ii. p. 325), under the name of *Micronisus poliopsis*, and to which he contends the Pegu birds belong. The diagnosis of this species is, "Very similar to *M. badius*, Gmel., but larger, the adult males a paler and purer grey, wanting the nuchal rufescent collar and the central throat-stripe, and with the cheeks and ear-coverts unicolorous with the crown." The young birds are also described as having no more than four bands on the central tail-feathers, instead of five or six as in *M. badius*, and "in both sexes the barring of the lower surface seems on the whole broader and more strongly marked than in any specimens of true *badius*." As regards the latter feature Mr. Sharpe remarks (Cat. Birds, i. p. 110) that it is "banded with broader and brighter vinous bands than its near ally." The absence of the throat-stripe and the few caudal bars are valuable characteristics in differentiating it from Ceylonese *M. badius*, but not so the vinous bands: in this respect *M. badius* appears to vary to a considerable extent, particularly as regards birds not fully aged; and this inclined Mr. Gurney to consider the Ceylonese example spoken of (*l. c.*) to belong to the *poliopsis* race. I have, however, shown him specimens in my collection exhibiting this peculiarity, and he now considers it to be of no specific value.

Young. These attain the full dimensions in the first year.

Iris, at first greenish yellow, changing to saffron-yellow with age, and passing then through various shades of orange to the red hue of old birds; cere and orbitar skin greenish, changing to yellow; legs and feet greenish yellow, the feet changing first to the adult yellow, and then the posterior part of the tarsus; bill dark brown, with the base only bluish.

Head, upper surface, with the wing-coverts rich brown, pervaded with an ashy hue, and conspicuously edged with brownish rufous, which, on the scapulars and tertials, is fulvescent, and across the hind neck often pales into whitish; the basal portion of the feathers is white, which shows more on the latter part than elsewhere; forehead, face, and above the eye buff-white, striated with brown, which coalesces on the ear-coverts with the rufous-brown of the sides of the head; quills brown, crossed by narrow dark bars (faint towards the tips), which show as blackish brown on the buff under-wing. Tail brownish grey, crossed on both webs of all but the lateral feathers with brown bars; these are usually five in number on the central feathers in the male, and six in the female, the basal bar lying beneath the coverts; on the remaining feathers the number varies, the penultimate in some examples having no more than the central feather, while others have six or seven according to sex.

Throat, fore neck, and under surface buff-white, the first-named part with a brown centre-stripe, and the rest of the feathers down to the belly with large umber-brown "drops" and dark shafts; these vary much in individuals—pale and narrow in some, dark and heavy in others, particularly on the chest; on the thighs and lower parts they narrow almost into stripes; under tail-coverts, in pale examples pure white, in dark, heavily-marked birds with narrow mesial stripes of brown.

In the younger stages the drops have a constant tendency to turn into bars, these latter being most prevalent on the flanks; many birds, I believe, have a tendency to the bar-like form of marking from the first, although this does not lead to any quicker or more gradual assumption of the sienna barring, peculiar to the adult plumage; for this is put on by a moult at once throughout the whole under surface, which takes place in some birds while the upper surface is still in the immature dress, and is sometimes mingled with the chest-drops and bold dark bars of the flanks. At this first moult to the adult dress the cheeks are generally streaked with brown on a pale ground.

Distribution.—The Shikra is distributed throughout the island, extending into and resident in most parts of the Kandyan Province. On the Nuwara Elliya plateau I have not observed it; but it is no doubt a visitant to that elevated region during the dry season. It is not uncommon on the Fort MacDonald patnas, and I have procured it on Namooni-Kuli Mountain, near Badulla, which has an elevation of more than 6000 feet; it is also met with in Dimbulla and the Knuckles district, so that it may be said generally to affect the mountain-zone. In the interior of the lowlands it is resident; and during the north-east monsoon it is common in the cultivated districts round the sea-coast, taking up its abode in the vicinity of human habitations. It is fond of establishing itself on cliffs, such as those at Trincomalie, and is frequently seen about the ramparts at Galle and

Jaffna. In the early part of May it retires into the interior to breed, and is not seen about its maritime haunts until October. In spite of this local migration to the sea-coast, the Shikra may be found throughout the year, in spots suitable to its habits, in most of the inland districts. In the Eastern Province I found it tolerably frequent in October, but scarcely met with it at all during two trips to the south-eastern forest districts. In the Western Province it is an inhabitant of the cocoa-nut districts bordering the sea-coast, retiring for the most part into the interior, as is the case on the east coast, during the south-west monsoon.

The Shikra is found pretty well all over the plains of India from the extreme south to the Himalayas, into which it ascends to an elevation of 5000 feet. It is a bird of local distribution, notwithstanding its extensive habitat. Mr. Hume speaks of it in Sindh as being not uncommon in the cultivated portions, but not found in the "desert or rocky tracts." Mr. V. Ball, again, says that it has a somewhat local distribution "in the large district of Chota Nagpur." It extends into Burmah and Malayana, and thence, according to Père David, into China, that is, if all the birds found in these regions belong to the true *badius* race; westward of Sindh it is found as far as Afghanistan; but this, I believe, is its furthest limit.

Habits.—This interesting little Hawk may be observed in every variety of situation but heavy forest. Cliffs on the sea-coast, rocky eminences in the interior, isolated groves of trees, cocoa-nut compounds surrounding native villages, the borders of paddy-fields and cinnamon-plantations dotted with large trees, are among the localities which it frequents. In the wilder parts of the country it is partial to "cheenas"* and new clearings in the forest, where it may be seen flying rapidly from tree to tree, or seated on a blackened stump discussing the remains of some lusty lizard. It affects coffee-plantations in the hills and bushy patnas, and is often seen in the vicinity of the bungalows, on the look-out, perhaps, for stray chickens. Its favourite diet is the ubiquitous lizard (*Calotes*), the remains of which I have found in every example dissected. It feeds also on mice and large beetles; and I once shot one on the Fort-MacDonald patnas in the act of darting at a Bulbul. It no doubt captures birds when pressed with hunger, but small reptiles and insects form the better part of its sustenance. It is commonly trained in India, and is taught to catch small game-birds; but its courageous disposition prompts it to attack (according to Jerdon) even "young Pea-fowl and small Herons." It is a persistent tormentor of both the Common and the Carrion-Crow in Ceylon, and may be often seen pursuing them high in the air, darting at them from above and beneath, much to the discomfiture of the "Corbies," who usually escape by a sudden swoop into the trees below. Its flight is a steady, straight-on-end movement, performed with quick beatings of the wings; but it sometimes soars to a considerable height, making quick circles, and then suddenly swoops down, alighting in an adjacent tree. It is a very noisy bird, making its shrill two-note whistle or scream heard for some distance, and furnishing a capital sound for the clever imitative powers of the Green Bulbul (*Phyllornis jerdoni*).

Mr. Ball remarks of it, in his avifauna of Chota Nagpur ('Stray Feathers,' 1874), "that at the season of the jungle-fires numbers of these birds assemble to hunt the grasshoppers and other orthopterous insects which are compelled to take flight before the advancing flames." Another writer, Mr. Thompson, says that they are very fond of frogs.

Nidification.—I have never succeeded in getting the eggs of this Hawk in Ceylon, though it must breed freely in the interior and not very far from the sea-coast. The nesting-season, I have ascertained from dissection of many examples, is from April to June; and it retires to sequestered jungles to rear its young, as I have met with it in the wilds of the interior at this season in a state of breeding. In India it breeds in April and May, and, in some parts, in June. The nest, writes Mr. Hume, "is usually placed in a fork high up and near the top of the tree. It is but loosely built of twigs and smaller sticks, lined with fine grass-roots, and averages about 10 inches in diameter." As architects he does not attribute to them much talent, remarking that they take "a full month in preparing their nest, only putting in two or three twigs a day, which they place and replace as if they were very particular and had a great eye for a handsome nest; whereas, after all their fuss and bother, the nest is a loose ragged-looking affair, that no respectable crow would condescend to lay in!" The eggs are usually three, but sometimes four; they are oval in shape and smooth in texture; they are delicate, pale bluish white, either devoid of markings or sprinkled openly throughout with faint greyish specks and spots. They average 1·55 by 1·22 inch.

* Land cleared by the natives for the purposes of cultivation.

ACCIPITRES.

FALCONIDÆ.

ACCIPITRINÆ.

Genus ACCIPITER.

Bill slightly shorter and more feeble than in *Astur*; festoon equally prominent. Nostrils large, oval, protected by the loral plumes. Wings similar to *Astur*, but the first quill longer; tail longer. Tarsi long, slender, the scutæ less pronounced; middle toe long, the inner reaching only to the first joint. Structurally of slender form.

ACCIPITER VIRGATUS.

(THE JUNGLE SPARROW-HAWK.)

Falco virgatus, Temm. Pl. Col. i. pl. 109 (1823).

Accipiter virgatus, Vig. Zool. Journ. i. p. 338 (1824); Blyth, Cat. B. Mus. A. S. B. p. 22 (1849); Jerdon, B. of Ind. i. p. 52; Hume, Rough Notes, i. p. 132; Jerd. Ibis, 1871, p. 243; Holdsworth, P. Z. S. 1872, p. 411 (first record from Ceylon); Hume, Stray Feathers, 1874, p. 141; Legge, Ibis, 1874, p. 10, and 1875, p. 276; Sharpe, Cat. Birds, i. p. 150; Gurney, Ibis, 1875, pp. 480–83; David and Oustalet, Ois. de la Chine, p. 26 (1877).

Nisus virgatus, Less. Man. d'Orn. i. p. 97 (1828); Schlegel, Vog. Nederl. Ind., Valkv. pp. 20, 59, pl. 12. figs. 1–4 (1866).

Accipiter stevensoni, Gurney, Ibis, 1863, p. 447, pl. xi.

Accipiter besra, Jerd. Madr. Journal, x. p. 84 (1839); id. Ill. Ind. Orn. pl. 4 (1847).

The Besra Sparrow-Hawk, Jerdon; *Besra*, popularly in India.

Besra (female), *Dhoti* (male), Hind. (*apud* Jerdon).

Jungle-Hawk, Europeans in Ceylon.

Yao, Chinese at Pekin (Père David).

Ukussa, Sinhalese.

Adult male (Ceylon). Length to front of cere 10·0 to 10·3; culmen from cere 0·5; wing 6·0 to 6·4; tail 4·6 to 5·0; tarsus 1·9 to 2·05; middle toe 1·2 to 1·25, its claw (straight) 0·35 to 0·4; height of bill at cere 0·27.

Iris yellow; cere, loral skin, and eyelid yellow; the top of the cere sometimes greenish; bill dark horn, base and near the gape bluish; front of tarsus greenish yellow; posterior part with the sides of the toes and the soles lemon-yellow.

In the fully aged bird the head, hind neck, back, and wings are very dark ashen, the head deeper than the rest and concolorous with the cheeks and ear-coverts; frequently a brownish wash is perceptible on the back; the hind neck

often with a rufous hue; quills brown, with a series of faint lighter bars, which show whitish beneath on the terminal half and buff towards the base; secondaries and tertials barred near the inner edge with white; tail brownish ashy above, tipped pale and crossed with four dark bands, the terminal one at the tip and the basal sometimes concealed beneath the coverts; on the inner web of the lateral feathers there are five indistinct bands, which fade out entirely in very old birds.

Chin and throat buff-white, with a broad central stripe of dark slate-colour; chest, sides of breast, and flanks uniform rufous, or sometimes with a few white streaks, caused by the edges of underlying brown-centred feathers; centre of the breast and the belly barred with rufous on a white ground; thighs rufous, barred slightly with pale grey; under tail-coverts pure white; lower surface of the tail grey; under wing-coverts buff-white, spotted with brown.

Obs. The under surface varies considerably in birds which have not quite reached the above fully-matured dress; these have usually an ashen hue on the sides of chest, the edges of centre chest-feathers white, and the middle of the lower breast and belly plainly barred with rufous ashen. Other examples have the white barring continued across the whole breast to the flanks, and in these the thighs are boldly barred.

Adult female. Length to front of cere 13·0 to 13·3; culmen from cere 0·52; wing 7·5 to 8·0; tail 6·0 to 6·5; tarsus 2·2 to 2·4; extent of wing 24·0 to 25·5.

Ceylon females do not often exceed 7·6 in the wing, the above limit applying to a fine specimen from Northern India in the British Museum.

Iris yellow, in some orange-yellow, with a dark outer rim occasionally; bill, legs, and feet as in male.

Hind neck, back, and wings smoky brown, but the head and nape similar to those of the male; the cheeks and ear-coverts paler than the crown; the light portions of the tail have the same smoky hue instead of being ashy as in the male; throat, fore neck, and centre of the chest white, the latter part boldly dashed with dark brown, running into the broad chin-stripe above; sides of the fore neck and chest rufous, the latter, together with the breast, flanks, and lower parts, boldly barred with white, the interspaces being rufous on the upper parts, and rufous ashen on the belly and thighs; under tail-coverts white, in some with terminal streaks of brown; under wing-coverts as in the male.

The female appears never to acquire the uniform rufous breast of the male; and the above description represents, I

ACCIPITER NISUS.

(THE SPARROW-HAWK.)

Falco nisus, Linn. S. N. i. p. 130 (1766).

Accipiter nisus, Pall. Zoogr. Rosso-As. i. p. 370; Gray, Gen. Birds, i. p. 29, pl. 10. fig. 4; Kelaart's Prodromus. Cat. p. 115; Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 104; Jerd. B. of Ind. i. p. 51; Hume, Rough Notes, i. p. 124; Sharpe and Dresser, B. of Europe, pt. ix.; Sharpe, Cat. Birds, i. p. 132 (1874).

Basha (female), *Bashin* (male), Hind., *apud* Jerdon; *Karghai*, Turki (Scully).

Adult female (India). Length to front of cere 14·0 to 16·0 inches; culmen 0·55; wing 8·0 to 10·0; tail 7·5 to 8·0; tarsus 2·3 to 2·5; middle toe 1·6 to 1·8, claw (straight) 0·5; height of bill at cere 0·3.

Adult male (India). Length to front of cere 11·8 to 12·2; culmen from cere 0·5; wing 8·0 to 8·3; tail 6·0 to 6·4; tarsus 2·2 to 2·3; middle toe 1·35.

Iris varying from saffron-yellow to orange-yellow; cere yellow; bill dark horn, bluish at the base; legs and feet gamboge-yellow; claws black.

Male. Above dusky slate-colour, darkest on the head, and more so on the upper back than on the rump; the feathers at the sides of the hind neck edged with rufous, and those at the back with white bases; quills ashy brown, the terminal portions of the primary outer webs greyish, the inner webs barred widely with brown and white internally towards the base; tail greyish brown, with four or five brown bars, the subterminal one the broadest.

A lightish space just above the lores; cheeks and ear-coverts more or less rufous; throat whitish, washed with rufous

think, the limit of this coloration. It is taken from a bird shot near Trincomalie, containing an egg ready for expulsion; and Mr. Sharpe, with his wide experience of the Accipitrinæ, remarked of this specimen that it was one of the oldest he had ever seen.

Young. Iris greenish yellow, sometimes mottled with brown specks; cere dull brownish green or greenish yellow: eyelid yellowish green; legs and feet greener in front than in adults; bill duskier.

The bird of the year has the head and nape deep brown, tinged with ashen; a whitish eye-stripe or supercilium; the bases of the nape-feathers white, showing on the surface more or less; the upper surface is chocolate-brown, edged with brownish rufous, brightest on the hind neck (and deeper throughout in the female); tips of the secondaries and tertials paler than those of the back feathers; quills barred with dark brown, the interspaces whitish at the inner edges; tail pale smoky, crossed by four bands, as broad as the interspaces, the terminal one at the tip; the inner web of the lateral feathers with 5 or 6 narrow light bars.

Throat and entire under surface buff-white, the chest and upper breast-feathers edged with rufescent buff or yellowish buff (in the female); a broad throat-stripe and long oval drops on the neck and chest of sepia-brown; the sides of the latter part brownish rufous; the lower parts with rounder spots of a lighter hue; flanks barred with rufous-brown; thighs with bold spots of brown; under tail-coverts narrowly streaked with the same; under wing-coverts buff, handsomely spotted with dark brown.

Obs. In this species a great variety of coloration in the plumage of the male is met with between the youngest phase and that noticed above of moderately mature birds, but notwithstanding the rufous character of the chest commences directly to assert itself, and serves to distinguish it from the opposite sex. By a change of feather in the first year the sides of the chest become rufous, the centre of the breast assumes a bar-like form of marking, while the flanks and thigh-coverts become regularly banded with rufous-brown. After the next moult the white centre of the chest becomes dashed with rufous and ashen streaks, and the flanks and sides of the breast assume their rufous covering, and present the appearance described above in not fully matured males; this is accompanied by the assumption of the cinereous upper surface and the consequent disappearance of the rufous edgings. In some birds of the second year the chest is striped with rufous, and the surrounding white portions of the feathers washed with the same. Malabar specimens are identical in size and character with Ceylonese; and an example from Chefoo in the British Museum corresponds as regards size with birds from Ceylon.

Distribution.—The Besra was first recorded as a Ceylonese bird by Mr. Holdsworth (*l. c.*). It is, however, a common species in the island, and, as Mr. Holdsworth remarks, may have been the bird referred to by

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and with the shafts dusky; chest, breast, flanks, and lower parts whitish, barred somewhat narrowly with rufous-brown bars edged with rufous; on the sides of the chest the bars are broadest, and on the abdomen they are wide apart; thighs narrowly barred, the insides more or less tinged with rufous, and a patch of the same on the lower part of each flank; under tail-coverts whitish or rufescent white, banded with narrow pointed bars of brown. Examples with marked rufous cheeks have the rufous portions of the lower parts and the under wing-coverts of a corresponding intensity.

Female. Less ashy above, the head and hind neck dark as in the male, and the latter part much edged with rufous in some examples; tail with an additional bar, there being always five on the central feathers; the markings of the under surface are browner, the darker hue predominating on the bars, which are only edged with rufous, and which are likewise more pointed than in the male; the chin and throat fulvous, with dark shafts to the feathers; under wing-coverts white, barred with dark brown.

Young (nestling). "Clothed with white down; the feathers of the back deep sepia-brown, with rufous margins; breast fulvous fawn, the chest longitudinally streaked with brown, inclining to arrow-head markings on the abdomen and to bars on the flanks." (*Sharpe*, Cat. Birds.)

Bird of the year. Iris paler yellow than in the adult; bill paler and yellowish at the base beneath.

Above brown, the feathers edged with rufous, and the nape marked with white, arising from the exposed basal portions of the webs; crown darker than the hind neck; quills rufescent white on the inner webs from the notch to base, both webs conspicuously barred with dark brown; tail brown, with five or six broadish bands of a darker hue, the lateral feathers with an additional bar and the inner webs pale.

Cheeks and ear-coverts brown, striated with whitish; throat white, with broad mesial brownish stripes; under surface

Kelaart as the European Sparrow-Hawk. It is possible, nevertheless, that the Doctor's identification may have been correct; and in support of the idea that the European Sparrow-Hawk may have occurred in Ceylon, I would here remark that I have lately received a specimen of the European Hobby from Ramisserum, auguring favourably for the occurrence of other northern Hawks in the latitude of Ceylon. As to the present species it is widely distributed in the low country and a frequent bird on the hills, ranging into the jungles of the main range, whence I possess an example killed at Nuwara Elliya. It is not uncommon in the northern forests, in the Eastern Province, and in the south-western hill district. I have obtained it at Baddegama and in Saffragam, and have met with it in other forests on the west side of the island. It is frequently obtained in the Kandy district and in the surrounding ranges, whence it figures now and then in the collections of Messrs. Whyte and Co., of Kandy.

This species is, according to Jerdon, found in all the large forests of India, inhabiting the Nilghiris, the Eastern Ghats in places, the Malabar and Central-Indian forests, and the slopes of the Himalayas. It is likewise an inhabitant of Burmah, the Malaccan peninsula, the Andaman Islands, Java, Borneo, Timor, and the Philippine Islands, and to the eastward of Burmah extends into China, Siberia, and Japan, if the birds from the latter country do not all belong to Mr. Gurney's larger, short-legged race *A. stevensoni*. It is not a very common bird in India, for most of the writers in 'Stray Feathers' speak of it as being local in the regions they treat of. Captain Feilden appears to be the only one who has procured it of late years in Burmah; and in the north-east of India, in the Mount Aboo district, but few specimens have been obtained.

In China, however, Père David says it arrives in the spring at Pekin in great numbers, and breeds in the mountains of the provinces.

Habits.—This little Sparrow-Hawk is a denizen of the jungle, rarely coming into the open country at any distance from its sylvan haunts. I have frequently met with it in pairs, both old and young, and have always found it a noisy bird, haranguing its feathered companions of the woods, who oftentimes collect in excited mobs and annoy it with their incessant chatterings. It generally perches on the large limbs of trees and flies from one to another, uttering its loud and shrill squeal, which somewhat resembles that of the little Goshawk (*Astur badius*). Its cries must often lead to its discovery in the jungles which it frequents, as on all occasions on which I have either met with it or shot it I have traced it by its note, which can be heard at some distance in the stillness of the primeval forest. It is shy, as a rule; but on one occasion, finding three immature birds

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white, boldly banded with spear-shaped broadish bands of brown and rufous, the latter hue mostly confined to the centre of the bar; the markings of the flanks darker than the rest; thighs barred with brown; under wing-coverts buff, with arrow-headed spots of brown; under tail-coverts whitish, unmarked.

Obs. This plumage is acquired by the dissolving of the longitudinal streaks of brown into the bold bar-shaped markings: this is well shown in the series of feathers given by Mr. Sharpe in an article on the subject (P. Z. S. 1873, pl. 39), and from which it can be observed that the longitudinal "drop" in the process of its dissolution expands at various points into bars, the white portion of the web advancing as an interspace to the shaft, leaving, however, at this first stage, pointed projections at the lower side of the bar, these being in reality the remains of the stripe.

Note.—I can neither include this, nor one or two other species to be noticed further on, as undoubted Ceylonese birds, as their occurrence in the island is, as in the present case, matter of uncertainty, or has been accepted from mere visual testimony. It appears advisable, however, to include them in footnotes, in order that sufficient information may be given to enable my Ceylon readers to identify the species should they occur hereafter in the island.

Distribution.—The evidence as to the occurrence of this species in Ceylon is summed up in the following sentence (Kelaart, Prodromus, p. 96):—"*Accipiter nisus* is very rare; we have only seen one *live* specimen." It is possible, as I have remarked in my article on *Accipiter virgatus*, that Kelaart may have been correct in his identification; but it must be remembered that, though a naturalist, he did not make ornithology his study, and those birds which were collected for him (he never used a gun himself) were identified by others, chiefly by Blyth, I believe. In the case of this bird, the specimen was a living one, so that I incline to the belief that it was a Jungle Sparrow-Hawk and not the European species. The latter is a cold-weather visitant to India, and is spread during that season, sparingly, over the whole of the empire. It is always to be found in the Nilghiris, on the Eastern Ghauts, and other hilly portions of Central India. It

together, I shot one, and the others were so tame as to fly out of the tree and immediately return to it again, one of them thereby following his companion into my collection. The diet of the Besra consists of small reptiles, coleoptera, and other large insects, the lizard (*Calotes*) being its favourite food in Ceylon. In India it is, says Jerdon, highly esteemed among native falconers, and is caught by means of a trap called there "Do Guz." This is a small, dark-coloured net, fixed to two thin bamboos lightly stuck in the ground, and which give way on the bird striking the net while it is dashing at a decoy picketed in front of it. On this happening the meshes instantly fold round the hawk and effectually prevent its escape. It is flown at partridges, snipes, and doves, and "is particularly active and clever in the jungle." The male is, however, according to the same writer, rarely trained. I do not think it is in the habit of soaring as much as its European ally. I have on one occasion seen it taking a few small circles in the air; but they were quickly over, and it again dashed off to its sylvan haunts.

Nidification.—In Ceylon this Hawk breeds about the month of May, during which I once procured a female containing an egg almost ready for expulsion, but which was unfortunately broken by my shot. It was of a pale green colour and unspotted, but would have most likely received some markings had the bird lived to lay it. In India nothing seems to be known concerning its nidification, and I never heard of its nest being found in Ceylon.

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is common on the southern slopes of the Himalayas, where also Mr. Hume's larger race (*A. melanochistus*) has its home. It is doubtfully recorded from Tenasserim; and in 1876 Mr. Hume received a specimen from the Andamans, which is its most south-easterly limit.

Dr. Jerdon remarks that "it comes in very regularly about the beginning of October, and leaves again about the end of February or March according to the locality."

It is spread over the whole of Europe, including Great Britain, and extends through Central Asia to China, and southwards from the Mediterranean into Algeria and north-east Africa.

Habits.—The Sparrow-Hawk frequents wooded country, and preys on small birds and quadrupeds. It is a bird of powerful flight, but not so active as its Indian congener, the Besra; but it is nevertheless trained for falconry in some parts of India. It is a bird of predatory disposition, and consequently it is under a ban in a game-preserving country like England. It is described in Yarrell's 'British Birds' as being so "daring during the season in which its own nestlings require to be provided with food as frequently to venture among the out-buildings of the farmhouse, where it has been observed to rapidly skim over the poultry-yard, snatch up a chick, and get off with it in an instant."

Nidification.—This species breeds sparingly in the Himalayas up to 8000 feet, building, as it does in Europe, in trees. In England it often takes possession of the nest of a crow, and repairs the lining for the reception of its own eggs. These are four or five in number, of a bluish-white or greenish-white ground, handsomely blotched and spotted with rich reddish brown or brownish crimson, the markings being sometimes collected in a zone near one end. Dimensions 1·7 by 1·3 inch. The beautiful specimens figured by Mr. Hewitson (plate vii. figs. 2 & 3) represent in a very interesting manner the variety in the eggs of the Sparrow-Hawk. The first is openly and handsomely blotched throughout with rich sepia, softened at the edges over other markings of light brownish, while the second has the obtuse end covered with confluent clouds of sepia-brown, overlying rather small and somewhat lineated blots, which are scattered rather thickly over the entire surface.

ACCIPITRES.

FALCONIDÆ.

BUTEONINÆ.

Bill weak, the festoon usually less developed than in the last subfamily; wings longer; tail moderate; tibia longer in proportion to the tarsus than in *Accipitrinæ*, the difference being "more than the length of the hind claw"*; outer and middle toe connected at the base as in *Accipitrinæ*.

Genus BUTEO.

Bill small and short, sloping from the base, the cere considerably advanced, and the comissure nearly straight, the festoon being only slightly developed. Wings long, pointed, the 4th quill the longest, or subequal with the 3rd. Tail compact, moderate in length, the feathers rigid; tip reaching beyond the closed wings and cuneate in shape. Tarsus moderately stout, the upper portion plumed more or less below the knee, the rest protected by broad transverse scales in front and *behind*. Toes shortish, the inner reaching to the last joint of the middle; claws short and moderately curved.

BUTEO PLUMIPES.

(THE INDIAN BUZZARD.)

Circus plumipes, Hodgson, Gray's Zool. Misc. p. 81 (1844).
Buteo plumipes, Hodgs. P. Z. S. 1845, p. 37; Jerd. B. of Ind. i. p. 91; Hume, Rough Notes, ii. p. 285; Jerdon, Ibis, 1871, p. 340; Hume, Str. Feath. vol. iii. p. 358, et vol. v. p. 347; Gurney, Str. Feath. vol. v. p. 65; Sharpe, Cat. Birds, i. p. 180, pl. vii. fig. 1 (1874).
Buteo vulgaris japonicus, Temm. and Schlegel, Faun. Jap. pls. vi. & vi. B.
Buteo japonicus, Bp. Consp. i. p. 18 (1850); Schl. Mus. P.-B. *Buteones*, p. 7 (1862); Blakist. Ibis, 1862, p. 314; Swinhoe, Ibis, 1870, p. 87; Jerdon, Ibis, 1871, p. 337; David and Oustalet, Ois. de la Chine, p. 19 (1877).
Buteo desertorum, Jerdon, Ibis, 1871, p. 338.
La Buse commune du Japon, Schl. Faun. Jap. p. 16.
The Harrier-Buzzard, Jerdon, B. of Ind.
Kara-Sā (in common with other Buzzards), Turkestan (Dr. Scully).
Kurula-goya, Sinhalese.

* Sharpe, Cat. Birds, i. p. 158.

Adult female. Length to front of cere 18·5 to 19·0 inches; culmen from cere 0·85; wing 15·0 to 16·5; tail 7·5 to 9·0; tarsus 2·6 to 3·2, bare front of tarsus 0·9 to 1·35; mid toe 1·5, its claw (straight) 0·7; height of bill at cere 0·4.

Adult male. Length to front of cere 18·0 to 18·5 inches; wing 13·5 to 15·6; tarsus 2·7 to 2·9, bare front of tarsus 0·9 to 1·5.

Obs. In the series from which the latter measurements are taken is included what appears to be an immature though not a very young bird in my own collection, from the south of Ceylon. Its detailed dimensions are:—Length to tip of bill 18·25 inches; wing 13·5; tail 7·25; tarsus 3·0, bare portion of front of tarsus 1·5; mid toe 1·5.

Iris dull yellowish mingled with brown or light hazel; cere varying from greenish yellow to yellow; gape yellow; bill blackish; legs and feet citron-yellow, claws black.

Above sepia-brown, dark and uniform on the forehead and back, and pale on the hind neck and greater wing-coverts, the feathers more or less margined with rufous mostly on the hind neck, scapulars, and wing-coverts, on the first of which the white bases of the feathers show considerably, and there is a dark nuchal patch; primaries and their coverts dark brown, the outer webs of the longer quills washed with greyish, the inner webs white internally and crossed with narrow bars of brown; secondaries paler, dark near the tips and with both webs barred, the white portions of the inner webs washed, in some, with rufous; the lateral feathers of the upper tail-coverts broadly margined with rufous and some barred with the same; tail rufous or brownish rufous, more or less shaded with brown, and washed at the margins of the rectrices with greyish, tipped with dull buff, and with a softened subterminal band and a number of narrow bars (incomplete in old birds towards the base) of brown; lateral feathers white internally.

Lores and a superciliary line blackish, a postorbital and moustachial streak dark brown, the feathers, as on the ear-coverts, pale-edged; throat whitish striped with brown; sides of the neck and chest rufous, in some brown, the shafts dark, and the margins of the feathers indented with rufescent whitish, which in some examples is conspicuous on the centre of the chest; breast and belly whitish or rufescent white, the feathers dark-shafted and barred with brown, in some on the lower breast, while other examples have the breast crossed with a wash of dark brown; lower flanks cinereous brown, greyish in old birds; thighs rufous, more or less cross-marked with brown; under tail-coverts fulvous, barred with rufous-brown; under wing whitish, painted down the centre with rufous and barred with brown.

Obs. The above description is taken from a number of examples in the British Museum, and is intended to embody as much as possible the characteristics of the very variable plumage in this species. Scarcely any two specimens are alike on the under surface; the older the bird the more covered with rufous-brown are the lower parts, and the less conspicuously barred is the tail. Many individuals exhibit a fuliginous phase, which is thought to be the result of old age, and which I will notice here as such, remarking, first of all, that such an example formed the type of Hodgson's species, which has been figured in Mr. Sharpe's admirable catalogue of the Accipitres.

Dark phase in old bird. In this the head, hind neck, and back, together with the wings, are uniform brown; tail dark brown, with the bands crossing the feathers completely, the subterminal one much marked; beneath, almost uniform brown, the centre of the breast alone being crossed with paler bands. In an example from Etawah the under surface is very dark, but the feathers have paler lateral margins, and the under tail-coverts are brownish buff, banded like ordinary adult birds, showing thus a remnant of the usual mature plumage, and demonstrating the fact that the fuliginous coloration has been a further advance beyond that stage and is the result of old age.

Young. Similar to mature birds described above, although scarcely any two specimens are alike. The primaries are paler brown, and have not the outer webs washed with ashy; the ground-colour of the upper tail-coverts not so pervaded with ashy; tail very variable, sandy brown, brownish grey, or greyish rufous, plainly barred on the central feathers with rather wavy bands of brown, uniting with the darker margins of the feathers, and the inner webs of the lateral feathers not so white as in adults.

Edge of forehead whitish; cheeks whitish striped with brown, the moustachial stripe streaked with white; throat and all beneath white or whitish buff; the chest and fore neck more or less broadly striped with brown, the markings coalescing down the sides of the fore neck in some; sides of the lower breast generally brown, uniting with the dark flanks; thighs fulvous, with brownish-rufous markings, in some showing indications of bars; abdomen and under tail-coverts buff, spotted with rufous; under wing whiter than in the adult, and the primary under-coverts with less brown on the terminal portions; basal half of primaries beneath pure white.

With age the thighs and flanks commence first to darken and the central rectrices lose their plainly defined bars, the brown hue gradually diminishing at the edge of the feather.

The following is a description of the Southern Ceylon example above alluded to:—

Head, hind neck, back, and wings sepia-brown; the mantle, wing-coverts, and rump with moderately deep rufous margins; the concealed edges of the scapulars and wing-coverts indented with whitish bars; the margins of the head and hind-neck feathers fulvescent whitish; the nuchal feathers dark brown at the tips, elongated as a rudimentary crest and showing much white at the base; primaries very dark brown, washed with grey on the outer webs, particularly about the notch; the inner webs almost entirely white from the notch upwards; secondaries paler brown, the internal portions white, crossed with narrow incomplete bars of dark brown; lateral upper tail-coverts rufous at the edges, and the concealed portions barred with rufescent white; general hue of tail rufous ashy, crossed with numerous narrow bars of dark brown, tipped with fulvous, the subterminal bar broader than the rest, the internal portions of all the lateral feathers white; inner webs of the central pair paling into white near the shaft.

Loral plumes dark with white bases; a narrow blackish line beneath the eye and a brownish postorbital stripe, beneath which the ear-coverts are whitish, narrowly lineated with rufous-brown; chin and throat buff-white, openly striated with narrow lines of brown and bounded on either side by a plainly marked brown moustachial streak; chest and under surface whitish buff, the former with large rufous-brown terminal patches almost covering the feather; the breast with smaller and indented central patches of the same; lower flanks well covered with brown, and the sides of the abdomen marked with pointed bars of rufous-brown; thighs in front and at the sides brown, with indistinct bars of rufous; interiorly fulvous, patched with brown; under tail-coverts with a few terminal spots of brown; under wing-coverts rufous, tipped paler and centred with brown; greater series uniform dark brown.

Obs. The African Buzzard (*Buteo desertorum*), with which Indian examples of the present species have until lately been confounded, is a smaller bird, the limit of the length of wing in the male being, according to Mr. Gurney's investigations, 13·5 to 15·4 inches, and in the female 14·3 to 15·85 inches. In their plumage, however, some specimens of this species so closely resemble the Indian bird that it is difficult to define the differences which exist by a mere description. It is not my province here to go into this matter, as the African bird is not likely to find its way to Ceylon. I will remark, however, that the dimensions of my bird from Southern Ceylon are low enough to relegate it to the ranks of the African species; but the locality in which it was shot, coupled with the fact of Lord Tweeddale possessing an unmistakable example from Ceylon, makes it necessary to refer my bird (in spite of its diminutive size and comparative large amount of bare tarsi) to the Asiatic form. Mr. Gurney, who carefully examined the specimen, supports this view, and informs me that he has never heard of a true *B. desertorum* having been procured to the eastward of Erzeroom. Furthermore Mr. Hume, in his exhaustive notice of the various Indian Buzzards ('Stray Feathers,' vol. iii. p. 58), removes *B. desertorum* from the Indian avifauna, assigning the specimens from the Nilghiris, formerly referred by him to this species, to the subject of the present article.

Distribution.—This interesting Buzzard, the Asiatic representative of the European *B. vulgaris*, is a very rare visitor to Ceylon, which island forms the most southerly limit of its wanderings in the cool season. Not more than two instances of its capture are known to me—the first of which is that of a large female in the museum of the Marquis of Tweeddale, and the second that of the example above alluded to in my own collection. The former was procured about the year 1865 by Mr. Spencer Chapman, but from what exact locality his Lordship is unable to inform me. I understand that the major portion of Mr. Chapman's collections was made in the west and north-west of the island, in one of which districts the Buzzard was probably met with in its passage from the Malabar coast to Ceylon. The specimen in my possession was shot in October 1871 at Maha Modera, a few miles to the north of the port of Galle, by Mr. Wylde, a gentleman for some time resident at the latter place. It had been haunting the vicinity of the bungalow for several days, having made its appearance there after the prevalence of high northerly winds, which usually bring down many of the Ceylonese migrants from the coast of India*.

Dr. Jerdon ('Ibis,' 1871, p. 338) writes, under the head of *Buteo desortorum*, that this species has been sent from Ceylon; but he probably refers to the specimen above mentioned as procured by Mr. Chapman, and which Mr. Holdsworth alludes to in his catalogue (*loc. cit.*).

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* This bird was referred to by me ('Stray Feathers,' vol. i. p. 488) as *Butastur teesa*: this, however, was a mistake, as the latter is a much smaller bird, and is now removed to a different subfamily, chiefly on account of the character of the scales on the hinder part of the tarsus.

In the south of the Indian peninsula the Harrier-Buzzard is found, during the cool season, in the Travancore and Nilghiri hills.

With regard to the former locality, Mr. Bourdillon, as quoted by Mr. Hume in his "First List of the Birds from the Travancore Hills" ('Stray Feathers,' 1876), says:—"This bird, a winter visitor, seems not to be uncommon during December, January, and February." From the Nilghiris Mr. Hume himself records it.

In the north of India it is found in Nepal, whence Mr. Hodgson's original specimen of *Buteo plumipes* came, along the southern slopes of the Himalayas to Sikhim, and thence into British Burmah, where Captain Feilden procured it in the province of Upper Pegu. On the north of the Snowy range it is found as a winter visitor in Kashgar, though Dr. Stoliczka, during his excursion to that remote region, met with it but rarely. Another observer, however, Dr. Scully, in his valuable "Contribution to the Ornithology of Eastern Turkestan" ('Stray Feathers,' 1876), mentions, at p. 125, the shooting of three examples at Yarkand in January, and this locality appears to form the westernmost limit of its range. He further remarks that it is common there during the winter, but was never met with in the plains after that season was fairly over, having moved away northwards about the 20th of April.

It is remarkable that when a movement of these birds *does* take place southwards in winter so many remain in the great upland of Turkestan, which, one would think, must possess quite as rigid a climate as the more northerly lower-lying regions, where they no doubt breed, and which may very likely be the mountainous country bounding the vast Mongolian empire on the north. Jerdon, however, in his note on *B. japonicus* ('Ibis,' 1871, p. 337), writes that he procured it "at Darjeeling, in Kumaon, and in Kashmir in *summer*, at a height of from 9000 to 10,000 feet," which savours much of its breeding in the higher parts of the outlying Himalayas.

The vast territory lying between the Himalayas and Eastern China has been but little explored, and therefore this Buzzard has not yet been recorded from it, though it doubtless inhabits, at one season or other of the year, the whole of this region. Père David, in his work on the 'Birds of China,' says that, although it is found in winter in the provinces of the S.E. of China, it penetrates rarely into the interior, and that he only got one example in the neighbourhood of Pekin. He remarks that Middendorf and Dybowski found it in East Siberia; so that its range would seem to lie in a more northerly track from Turkestan, probably through the north of Mongolia to Siberia and Japan, in which latter country it is the common Buzzard, and styled as such in the 'Fauna Japonica.' In the winter it moves in a southerly direction down the coast of China, where Mr. Swinhoe found it as far south as the island of Hainan. Captain Blakiston procured it in the island of Yesso, the most northerly of the Japanese group, and Col. Prejevalsky observed it during a voyage from Kiachta to Pekin.

Habits.—This species seems to prefer open country to forests and jungle, in which it exhibits much of the nature of a Harrier, hunting for its food over marshes and bare land with a steady flight. My specimen, Mr. Wylde informed me, took up its quarters in the cocoa-nut compounds and paddy-fields near his bungalow, about which it appeared to prowl as if intent on the capture of some of the poultry. When dissected, however, its stomach contained the remains of lizards. Its manners, however, on this occasion were evidently those of a new arrival by no means at home in its quarters; and after a few days it would evidently have betaken itself to some open upland district in the interior.

Captain Feilden remarks ('Stray Feathers,' 1875, p. 30):—"I found this bird at the edge of the parade-ground in tolerably thick tree-jungle with partially cleared underwood."

In Turkestan, Dr. Scully observed it, in company with *Buteo vulgaris* and *B. ferox*, hunting everywhere over the rush-grown frozen marshes, these birds being "so intent on the work they had in hand that they often seemed to disregard one's presence and approached so close as to be easily shot."

Further testimony as to its Harrier-like habits is afforded by Mr. Bourdillon's observations of it in the Travancore hills, "where two or three might be seen steadily quartering the ground, and occasionally pouncing on some mouse or lizard," and were noticed "to perch both on trees and on stones, and beat backwards and forwards over a field of young coffee."

Mr. Swinhoe writes:—"I fell in with this bird on the island of Naochow. He was resting at noon, after a meal off *Passer montanus*, in one of the bushy trees of a small grove. My appearance disturbed him, and he flew across heavily, when I secured him." ('Ibis,' 1870, p. 87.)

The testimony of various observers therefore goes to prove that this Buzzard is a bird of solitary habit, straying about alone, and usually so intent on securing the various prey on which it exists, that it is any thing but a shy bird.

Nidification.—I am unable to give my readers any information on the breeding of this Buzzard. In these days of ornithological research the day is doubtless not far distant when it will be discovered nesting in the Himalayas, or its breeding-haunts in the comparatively unknown regions of Central Asia penetrated by some adventurous explorer.

Subfam. AQUILINÆ.

Bill variable, usually lengthened and straight at the base; but in some (smaller genera) more curved and shorter, the margin festooned. Wings generally long; the 4th quill usually the longest, in some the 3rd and 4th, and in others the 4th and 5th. Tarsus less than the tibia by more than the length of the hind claw, but more than half its length; in some feathered entirely to the toes, in others partially, with the *hinder portion* always *reticulate.*

ACCIPITRES.

FALCONIDÆ.

AQUILINÆ.

Genus NISAETUS.

Bill strong, moderately lengthened, but not so much so as in *Aquila*, the culmen curving from the cere, its length not exceeding the hind toe; tip much hooked; the margin prominently festooned. Nostrils large, oval, and directed downwards. Wings with the 5th quill the longest, of moderate length, shorter than in *Aquila*. Tail moderate, even at the tip. Tarsus shorter than the tibia, stout, clothed with feathers to the toes, which are large and covered with three large scales at the tip. Claws large, much curved, the inner claw much larger than the middle.

NISAETUS FASCIATUS.

(BONELLI'S EAGLE.)

Aquila fasciata, Vieill. Mém. Linn. Soc. Paris, 1822, p. 152.
Falco bonellii, Temm. Pl. Col. i. pl. 288 (1824).
Aquila bonellii, Less. Man. Orn. i. p. 83 (1828); Gould, B. of Europe, i. pl. 7 (1837); Kelaart, Prodromus, Cat. p. 114 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 98; Tristram, Ibis, 1865, p. 252; Shelley, B. of Egypt, p. 206.
Eutolmaetus bonellii, Blyth, J. A. S. B. xiv. p. 74 (1845); Hume, Rough Notes, i. p. 189.
Nisaetus grandis, Jerd. Ill. Ind. Orn. pl. 1 (1847).
Pseudaetus bonellii, Hume, Nests and Eggs, i. p. 33.
Nisaetus bonellii, Jerd. B. of Ind. i. p. 67 (1862); Holdsw. P. Z. S. 1872, p. 411.
Nisaetus fasciatus, Sharpe, Cat. of Birds, i. p. 250 (1874); Dresser, B. Eur. part xxxiv. (1874).
The Crestless Hawk-Eagle, Jerdon; *The Genoese Eagle*, Kelaart.
Perdicero; Aguila blanca, Spanish.
Mhorungi, lit. "Peacock-killer," Hind.; *Rajali*, Tam. (*apud* Jerdon).

Adult male. Length to front of cere 25·0 to 26·5 inches; culmen from cere 1·6; wing 18·5 to 19·5, expanse 62·0; tail 11·5; tarsus 3·5 to 3·7; mid toe 2·3 to 2·5, claw (straight) 1·2; hind toe 1·5 to 1·6, claw (straight) 1·6; height of bill at cere 0·7.

Female. Length to front of cere 26·0 to 27·0; culmen from cere 1·6 to 1·7; wing 18·6 to 20·3; tail 11·2 to 12·0; tarsus 3·6 to 4·0; mid toe 2·6, claw (straight) 1·3; hind toe 1·6.

Obs. Some adult females are quite as small as males. In Hume's 'Rough Notes' the dimensions of the wings of three females are given at 20·0, 19·63, and 19·65, and the expanse of the largest 67·0.

Iris bright yellow, in some brownish yellow; cere yellowish; bill blackish brown, paling into bluish horn about the cere, the gape yellowish; feet yellowish or whitish brown.

Above deep brown, very dark on the rump; the feathers of the head, neck, upper back, and wing-coverts with pale margins, and the concealed portions white; longer scapular feathers almost black near the tips; feathers of the nape elongated; edge of the wing from the flexure to the front white; median coverts paler brown than lesser, with a dark patch near the tips and the bases mottled; primaries and secondaries black-brown, the outer webs of the longer quills washed with grey, the inner webs of all whitish towards the base and crossed by narrow bars; inner webs of secondaries mottled with white; upper tail-coverts tipped with greyish white; tail brownish grey or cinereous brown, with a *broad terminal band* of blackish brown, and the basal part of the central feathers marked transversely near the shaft with wavy brown rays, which, on the more lateral feathers, develop into narrow irregular bars.

Loral plumes blackish; a blackish-brown moustachial patch; ear-coverts and the sides of the neck below them tawny brown, striped with a darker hue, and the space above them at the posterior corner of the eye whitish; under surface from the chin to the belly white; the throat with fine mesial lines, and the fore neck, chest, and breast with blackish-brown central stripes, generally broadest at the sides of the breast and flanks, and in some specimens very wide on the chest; thighs variable, in some specimens dark brown with pale indentations, in others much paler, but with the same character of marking; abdomen and under tail-coverts lighter brown than the thighs, barred with whitish; axillary plumes brown, spotted with white; under wing-coverts blackish brown, much marked with white along the edge; tarsal feathers pale brownish.

Obs. Some examples incline from their youth to be darker on the thighs and abdomen than others, and consequently a considerable variation exists in these parts in adults. As a rule the older the bird (a sure characteristic being the tail) the narrower are the stripes of the under surface.

Occasionally it would appear that the tawny hue, to be noticed presently, continues to remain on the under surface, the stripes and the dark colouring of the underparts being as in the normally white birds. There is a beautiful example in this plumage in the British Museum, from Mr. Howard Saunders's Spanish collection.

Young. The bird of the year has the upper surface and wing-coverts of a medium or sandy brown, the feathers with dark shafts; the head and hind neck tawny, with the feathers dark-centred; primaries lighter than in the adult, and the outer webs similarly pervaded with grey; the bars of the inner webs more extensive; secondaries broadly tipped with dull white; these and the greater coverts have in some examples a strong purplish lustre; upper tail-coverts brownish, paling into white at the tips, and with dark shafts; tail light sandy brown, mottled on the central feathers, and with a deep pale tip, the whole crossed with seven or eight narrow wavy bars of dark brown, without any broad terminal band; in many examples the bars are undefined, and run into the mottlings of the interspaces; *no broad band* at the tip.

Face, ear-coverts, and sides of head concolorous with the adjacent brown parts; the ear-coverts striated with a darker hue; throat and entire under surface uniform brownish rufous, paler on the chin and with clearly defined shaft-lines, diminishing towards the lower parts; abdomen, thigh-coverts, and under tail-coverts unstriated, but with the centres of the concealed portions of the feathers brown, showing the tendency of these parts to become dark with age; under wing-coverts rufescent like the breast and striped with brown, the lower series dark brown.

With age the rufous of the under surface becomes white, the mesial lines expand at the tip into "drops," and thence into broadish stripes; the thighs and legs become brown with darker stripes, while the belly and under tail-coverts are heavily dashed with the same; the under wing-coverts become blackish brown at the same time.

Distribution.—This powerful Eagle, the finest of the short, curved-billed genus *Nisaetus*, and so well known in Southern Europe and Northern India, has been once procured in Ceylon. It can therefore only be looked upon as a straggler to the island, and takes its place in our lists as such, in common with the Scavenger-Vulture and the Amurian Kestrel.

Layard writes, in his notes on Ceylon ornithology (*l. c.*) :—"This Eagle was procured by R. Templeton, Esq., R.A., several years ago, and I do not know from what part of the island it was obtained. It has not fallen under my notice*, nor has Dr. Kelaart enumerated it amongst his acquisitions at Nuwara Elliya." Many

* There, notwithstanding, is a faded specimen of this Eagle in the Poole collection. It has the wing 19·5, tail 10·0, tarsus 4·0 inches; the peculiar brown coloration of the exterior of the thighs is still visible, although the head and all the under surface are bleached. Mr. Layard writes me that he does not remember any thing about this specimen, and its presence, evidently as a Ceylon bird, in this collection is somewhat puzzling. Can it be that this is Dr. Templeton's specimen, afterwards presented to the collection while at Sir Ivor Guest's.

years have elapsed since this occurrence, which was prior to 1858; and since then I am unable to find any record of its having been met with in Ceylon. The specimen referred to was identified by Mr. Blyth, when he was Curator of the Calcutta Museum, so that there is no chance of the species having been mistaken for any other Eagle.

Bonelli's Eagle is, as far as the Indian peninsula is concerned, chiefly confined to the northern part of it. It is not uncommon in portions of Bengal, but not so in the lower districts of the Province.

In Madras and the south generally, it is rarer; and I notice that it is not included in the "First List of Birds from the Travancore Hills" ('Stray Feathers,' vol. iv.) even as a rare visitor. Dr. Jerdon, however, records it from the Nilghiris, whence it no doubt visited Ceylon when procured by Templeton.

It is an inhabitant of the slopes of the Himalayas; Mr. Brooks records it among the birds he observed between Mussoori and Gangaotri. In the north-east of India it is more common than elsewhere; for in Sindh, Mr. Hume says, "one, two, or more pairs are to be met with about every large lake, making terrible havoc amongst the smaller water-birds, and carrying off wounded fowl before one's eyes with the greatest impudence." In Southern Europe, Bonelli's Eagle is a well-known bird. Lord Lilford and Mr. Howard Saunders speak of its common occurrence in Spain, and on the northern coasts of Africa it is also pretty freely distributed.

Mr. Brooke has met with it in Sardinia; and Canon Tristram remarks that it is more common in Palestine than the next species, being generally found in the wooded hills about Carmel, Tabor, and the Lake of Galilee.

Habits.—Rocky wooded hills, mountainous jungles, and forests in the vicinity of high land are the habitat of this bold and daring Eagle. Jerdon says that "it is much on the wing, sailing at a great height, and making its appearance at certain spots, in the districts it frequents, always about the same hour." The latter propensity is noticeable in other birds of prey, for I have remarked it in the Sea-Eagle and Crested Hawk-Eagle of Ceylon. The present species is very powerful in the legs and feet, and is known to kill the smaller kinds of game and hares with ease. It is, however, so strong and active on the wing that it preys largely on various birds, such as Jungle-fowl, Partridges, Ducks, and Herons, and, according to Jerdon "even Peafowl."

It is very destructive among Fowls and Pigeons; and it is recorded, in the 'Birds of India,' that a pair committed great devastation among several pigeon-houses in the Nilghiris.

The following interesting account of the manner in which these robbers captured the Pigeons is given by Jerdon at page 69 of his first volume:—"On the Pigeons taking flight, one of the Eagles pounced down from a vast height on the flock, but directing its swoop rather under the Pigeons than directly at them. Its mate, watching the moment when, alarmed by the first swoop, the Pigeons rose in confusion, pounced unerringly on one of them and carried it off; and the other Eagle, having risen again, also made another and, this time, a fatal stoop." Such a bird as this would do much damage in the poultry-yards of many a pretty bungalow in the Kandyan province.

Concerning its economy in Palestine, Canon Tristram remarks as follows:—"It perches on some conspicuous point of rock looking out for its prey, and after a short circling excursion will again and again return to the same post of observation. I take it to be more truly a game-killing Raptor than any of the preceding Eagles" (the Golden, Imperial, Tawny, and Booted), "and less addicted to carrion-feeding than any of its congeners. The Rock-Pigeons are its favourite quarry in the winter, and it preys much on the Turtle-Doves in the Ghor and the plain of Gennesaret. I have also seen it pursue Kites, apparently with the intent of robbing them."

Its fondness for Pigeons was noticed by Mr. Hume, who killed the male of the pair which form the subject of his interesting article in 'Rough Notes,' returning to the nest with a Little Brown Dove (*Turtur cambayensis*) in its talons. This Eagle has a singular habit of packing in large flocks, one of which very unaquiline assemblies was witnessed by Lord Lilford in Spain, he being informed that such flights were not unfrequently seen. This was in May, during the breeding-season of the species; and, as is remarked, the bird being a permanent resident in the country, it is a difficult matter to account for such an assemblage. The note of this Hawk-Eagle is described as being a "shrill croaking cry."

Nidification.—In the plains of India Bonelli's Eagle breeds in December and January, and in the Himalayas and the district of Kumaon much later, commencing in April and continuing until June. In the

Nilghiris it breeds as early as December. The nest is usually placed in the ledge of a cliff, but it has been found fixed in the branches of large trees. It is a huge platform of sticks, containing in the centre a circle or layer of fresh green leaves, on which the eggs are laid, and which the bird covers them with on leaving the nest, in the same manner that I have myself seen the Grey-backed Sea-Eagle do.

Mr. Hume, in his interesting account of the taking of this Eagle's nest, given in 'The Ibis' for 1869 (p. 143), speaks of one nest visited as being five feet in diameter. The situation of this nest is thus described:—"About a mile above the confluence of the clear blue waters of the Chambal and the muddy stream of the Jumna, in a range of bold perpendicular clay cliffs that rise more than 100 feet above the cold-weather level of the former, I took my first nest of Bonelli's Eagle. In the rainy season, water trickling from above had (in a way trickling water often does) worn a deep recess into the face of the cliff, about a third of the way down. Above and below it had merely grooved the surface broadly, but here (finding a softer bed, I suppose) it had worn in a recess some 5 feet high and 3 feet deep and broad. The bottom of this recess sloped downwards; but the birds, by using branches with large twiggy extremities, had built up a level platform that projected some 2 feet beyond the face of the cliff. It was a great mass of sticks fully half a ton in weight, and on this platform (with only her head visible from where we stood at the water's edge) an old female Eagle sat in state."

The eggs are usually two in number; but some nests have been found with only one. They are described by Mr. Hume as "moderately broad ovals, varying slightly in size." They are whitish in colour, sometimes quite unmarked, but usually are faintly blotched with pale yellowish or reddish brown. The markings in others, as given by Mr. Brooks, are darker, or "bright reddish brown, sparingly intermixed with light reddish grey." They average in size 2·78 by 2·1 inches.

In the Holy Land, Canon Tristram found it nesting on the cliffs of the deep gorges characteristic of that country. He writes, in 'The Ibis,' 1865, p. 253:—"It does not appear to lay till the end of March, and then generally a single egg. These are either white or with the faintest russet spots. One nest, which contained two eggs both fairly coloured, baffled all our attempts at its capture. It was comfortably placed under an overhanging piece of rock near the top of the cliffs of Wady Hamam, in such a position that no rope could be thrown over to let down an adventurous climber; and yet from another point, which projected nearly parallel to it, we could look into the nest with longing eyes. The old birds seemed perfectly aware of the impregnability of their fortress."

NISAETUS PENNATUS.

(THE BOOTED EAGLE.)

Falco pennatus, Gm. S. N. i. p. 272 (1788); Temm. Pl. Col. i. pl. 33 (1824).

Aquila pennata, Vig. Zool. Journ. i. p. 337 (1824); Gould, B. of Europe, i. pl. 9 (1837); Fritsch, Vög. Eur. tab. 5. figs. 3, 4, 5 (1858); Kelaart's Prodromus, Cat. p. 114 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 98; Jaub. et Barth. Rich. Orn. p. 36, pl. 3 (1859); Jerdon, B. of Ind. i. p. 63; Holdsworth, P. Z. S. 1872, p. 411; Shelley, B. of Egypt, p. 207 (1872); Legge, Str. Feath. vol. iv. p. 249; Dresser, B. Eur. pt. xxxii. (1874).

Butaetus pennatus, Blyth, Journ. Asiat. Soc. Beng. xiv. p. 174 (1845).

Hieraetus pennatus, Blyth, Journ. Asiat. Soc. Beng. xv. p. 7 (1846); Hume, Rough Notes, i. p. 182 (1869).

Nisaetus pennatus, Sharpe, Cat. Birds, i. p. 253 (1874).

Le Faucon patu, Briss. Orn. vi. App. p. 22, pl. 1 (1760).

The Dwarf Eagle, Sportsmen in India.

Bagati Jumiz, Hind., lit. "Garden Eagle;" also *Gilheri-mar*, lit. "Squirrel-killer;" *Oodatal Gedda*, Tel., lit. "Squirrel Kite" (*apud* Jerdon).

Punja-Prāndu, Tam., lit. "Field-Kite."

Rajaliya, Sinhalese.

Adult male. Length to front of cere 19·5 to 21·0 inches; culmen from cere 1·02 to 1·2; wing 14·5 to 15·5; tail 8·2 to 8·5; tarsus 2·3 to 2·4; mid toe 1·5 to 1·7, claw (straight) 0·75 to 0·8.

Adult female. Wing 15·0 to 16·4; tail 8·5 to 9·5; tarsus 2·3 to 2·5; mid toe 1·5 to 1·7; culmen from cere 1·15 to 1·3.

This limit of wing is from a series of Bengal, Turkish, and Spanish examples. Mr. MacVicar's specimen, referred to below, which was a female and an Indian-bred bird, measured 15·7 in the wing; a male, in my own collection, purchased from Messrs. Whyte and Co., 15·2.

Iris varying from pale brown to chestnut-brown; cere yellow; bill black at the tip, paling into leaden or bluish at the base, and with the gape yellow; feet yellow; claws black.

Head and hind neck brownish tawny, darkest on the forehead and crown (in some paler or fulvous tawny), the shafts of the feathers dark and their margins pale; back, rump, scapulars, lesser and greater secondary wing-coverts dark earth-brown, with the edges of the feathers slightly paler; median wing-coverts, uppermost tertials, and some of the scapular feathers pale brownish, darkening towards the shaft of the feather; primaries and secondaries blackish brown, with obsolete bars on the light portions of the inner webs and the extreme tips whitish; upper tail-coverts sandy fulvous; tail blackish brown, lighter than the tips of the quills; traces of obsolete transverse marks exist in many specimens; the inner webs of the lateral feathers mottled with whitish.

Plumes of the lores and round the eye black; cheeks, ear-coverts, and a space below them dark tawny, with a narrow blackish-brown moustachial stripe; throat and fore neck buff, paling slightly on the whole under surface and under wing into buff-white, the throat marked with central stripes concolorous with the ear-coverts; these become narrower on the chest, and gradually change into shaft-lines on the breast and flanks and secondary under wing-coverts; primary under coverts spotted with dark brown. The amount of striation on the under surface varies much, and some examples have the stripes confluent across the throat.

Dark form. The plumage above has the same character as the foregoing, but is much darker throughout both as regards body and the wings and tail; the light portions of the wing-coverts and tail are very much darker than in the

pale bird; the forehead and crown are well covered with black feathers, and the hind neck rufous instead of pale fulvous; the upper tail-coverts are darker than in the pale bird; the chin and cheeks are boldly dashed with blackish brown; and the entire under surface uniform wood-brown, the centres of the feathers black, blending with the ground-colour.

Young. The nestling has the iris brown, and the legs and feet yellow, like the adult.

Obs. In the splendid series possessed by the British Museum, many of which were collected by Mr. Howard Saunders in Spain, are two nestlings obtained from the nest, with the parents, by that gentleman. One is a light bird, and the other a very dark one, demonstrating the fact that *light and dark* birds exist from the very nest, and are the offspring of the same parents. This fact solves the problem as to the light and dark birds of both sexes, which has so long engaged the attention of naturalists. Mons. Bureau, in his paper on this Eagle, published in the 'Proceedings' of the Association Française pour l'avancement des Sciences, Nantes, goes very fully into this singular feature in the economy of the Booted Eagle, proving by his observations that sometimes birds of the light and dark type pair together, the union of similar-plumaged birds being of course the commoner; and he remarks, with reference to the progeny, "De l'une ou l'autre de ces unions naissent habituellement des jeunes d'un seul type; plus rarement on trouve dans une même nichée des jeunes de l'une ou de l'autre race." This conclusion is substantiated in the case of the two young birds now alluded to, the parents of whom belonged to the two phases. In the 'Birds of Europe,' Mr. Dresser cites several instances of light and dark birds breeding together in Russia and producing young of both descriptions. The description of the above-mentioned nestlings is as follows:—

Pale form. Head and hind neck light but rich sienna, the feathers of the crown with dark shafts; back, lesser secondary wing-coverts, and longer scapulars deep wood-brown, with a purplish lustre; the tail broadly tipped with whitish; scapulars, tertials and major wing-coverts, primaries, and secondaries blackish brown, the latter paling at the tips into the hue of the coverts; upper tail-coverts light fawn-brown with dark shafts; under surface very pale fawn, richest on the chest, where the feathers have dark shaft-stripes.

Dark form. Head and hind neck rich tawny, the forehead blackish, and the crown with dark shaft-lines; dark portions of the upper surface much the same as the pale bird, but the scapulars and wing-coverts darker; cheeks, fore neck, and entire under surface dark brown, quite as intense as in the full-grown dark bird.

With its advance towards maturity, the pale bird becomes lighter on the head and under surface. The head and hind neck are rich tawny, with the shaft-stripes narrower than in the adult, and the crown not so dark; the ear-coverts and sides of the neck are rich tawny brown, this part blending evenly into the paler fawn-colour of the chest; the moustachial streak is dark and unites with the surrounding tints; the wing-coverts and scapulars have a greater extent of pale tipping, which extends to the least coverts along the front of the wing: the upper tail-coverts are very pale, and the light tip of the tail deeper than in the adult; the entire under surface is pale fawn, blending into the darker hue of the chest, which is handsomely striated as in the adult, but the streaks not contrasting so much with the feather.

With age, in the dark form, the tawny hue of the head and hind neck gradually changes to the darker coloration of the adult; the crown and forehead become more uniformly brown, and the light edgings of the back feathers less conspicuous, finally darkening into the ground-colour.

Distribution.—This bold little Eagle, so well known in Southern Europe and India, appears to pay occasional visits to Ceylon, and has been obtained both in the maritime and moderately elevated hill-districts. It was first killed by Edgar Layard near Pt. Pedro, during his official residence at that place. The season of the year was that in which Asiatic Raptors usually visit the island, and at the same time, during the prevalence of the north-east monsoon in 1875–6, two additional examples were collected. The first, a fine female, was killed by Mr. H. MacVicar, of the Survey Department, in the cinnamon-gardens close to Colombo, and was presented by that gentleman to the Colonial Museum; the second was shot in the district of Dumbara, near Kandy, was preserved by Messrs. Whyte and Co., of that town, and afterwards passed into my hands.

I am under the impression that I have seen this species myself in the north-eastern part of the island; but I can no more speak with certainty concerning it than I can satisfy myself as to the identity of several Hawks not in our lists, which I have met with in the forests of Ceylon and failed to shoot.

In India this Eagle is pretty fairly distributed as far as the plains are concerned; but its numbers are greater in the north than in the south. It is not found at any elevation in the mountains, and does not inhabit

Burmah in any quantity. It is recorded as being comparatively rare in Pegu, neither Mr. Oates nor Captain Feilden having procured many examples of it in that region.

From the west of India its range extends through Persia to Palestine, south-eastern, southern, and central Europe; whereas on the south of the Mediterranean it inhabits Egypt and Algeria, and thence extends, probably by way of the east coast, to the south of the continent, having been procured in Damara Land by Mr. Andersson. Lord Lilford found it common in Spain near Seville, and remarks that it inhabits many other parts of the Peninsula. Mons. L. Bureau records it as an inhabitant of the west of France, and Count Wodzicki of the Carpathians, while other naturalists, as quoted in Mr. Dresser's 'Birds of Europe,' have met with it in Central Germany and many parts of Russia. In Palestine Canon Tristram believes it to be confined to the north, and only observed it between the months of October and March.

Habits.—The Booted Eagle frequents hilly, wooded country, as well as open plains, cultivated land, and ground covered sparsely with small timber and scrub, where it finds an abundance of food in birds, small vermin, and perhaps some kinds of reptiles. It is partial to districts where woods and clumps of forest are intermingled with low jungle. It is a bold and daring bird and very active on the wing, in testimony of which Mr. Hume, in his 'Rough Notes,' quotes from the letters of Mr. R. Thompson, who observed one of these Eagles dash into a tree, and seize a bird out of a flock of Parakeets, while on another occasion he witnessed the attempted capture of a rat on the ground. Layard, in writing of the specimen he shot at Pt. Pedro, after narrating that he had mistaken it in the twilight of the morning for a Brahminy Kite, remarks, "it suddenly pounced upon a Bulbul roosting in an oleander bush : this at once undeceived me; and as it rose with its victim in its claws, I fired and brought it to the ground. It fought with determined spirit and kept a small terrier at bay, till I killed it with the butt-end of my gun."

Jerdon, in his 'Birds of India,' notes its destructive habits, and says that it pounces on doves, pigeons, and chickens, and that it forages about villages in company with Kites, who are often unjustly blamed for the depredations in reality committed by the "Dwarf Eagle." Although fierce in its nature it is at times sociably inclined, even towards other members of its order; for Mr. Brooks has seen it, several at a time, seated on the ground in company with the Common Kite. The note of the Booted Eagle is a wild scream, which is said to be different from that of most other Eagles. It was observed by Capt. Feilden in Burmah to perch much in thickly foliaged trees, a somewhat abnormal habit for the Eagle family.

In Spain it appears, says Lord Lilford, "to prefer open country and isolated groups of trees to large extents of forest," and is, according to the natives, "the scourge of the Quails in Andalucia." It arrives in the country in April, breeds there, and departs in October.

Nidification.—The Dwarf Eagle does not breed commonly within the Indian limits. Mr. Hume records, in 'Nests and Eggs,' a nest found at Hurroor, near Salem. It was built in the branch of a high banyan tree, about 50 feet from the ground, and consisted of dry twigs, being a circular platform in shape, with a slight depression in the centre and devoid of lining. The eggs were two in number, of a dead white ground-colour, and one of them blotched and streaked with reddish brown. The egg measured 2·13 by 1·78 inch. In Spain, Lord Lilford, who found many nests, chiefly built in pine-groves, says that they are invariably lined with green leaves, which is a common practice with the Eagle tribe. These nests, when built in pines, were situated at the junction of a large lower branch with the trunk, and all, as well as others found by him, contained two eggs. The figures on pl. x. of 'The Ibis' for 1866 show the variation in the colouring, the one being dull white with a few faint reddish blotches about the centre, and the other clouded and dashed with two or more shades of light reddish. The lighter of the two measures 2·04 by 1·73 inch, and the larger and more handsomely coloured 2·26 by 1·83 inch.

ACCIPITRES.

FALCONIDÆ.

AQUILINÆ.

Genus LOPHOTRIORCHIS.

Bill curved more suddenly from the base than in *Nisaetus*, less stout, and with the tip not so prolonged; margin not prominently festooned. Nostrils circular, rather small, and placed near the edge of the cere. Wings moderate, reaching, when closed, beyond the middle of the tail; the 4th and 5th quills subequal and longest, or the 5th shorter than the 4th. Tail moderate, broad at the base, rounded at the tip. Tarsus as in *Nisaetus*; middle toe long, with the claw rather short; lateral toes nearly equal, but with the inner claw nearly as long as the hind one. Head crested; the feathers short, broad at the base, and pointed at the tip, forming a wedge-shaped crest, which originates above the occiput.

LOPHOTRIORCHIS KIENERI.

(THE RUFOUS-BELLIED HAWK-EAGLE.)

Astur kieneri, G. S.*, Mag. Zool. 1835 (Aves), pl. 35.

Spizaetus albogularis, Tickell, J. A. S. B. xi. p. 456 (1842).

Limnaetus kieneri, Strickland, Ann. N. H. xiii. p. 33 (1844); Jerdon, B. of Ind. i. p. 74; Bligh, J. A. S. (C. B.) p. 64 (first record from Ceylon); Legge, Str. Feath. 1875, p. 198; Gurney, Ibis, 1877, p. 433.

Spizaetus kieneri, Gray, Gen. B. i. p. 33 (1845); Schl. Mus. P.-B. *Astures*, p. 11; Wall. Ibis, 1868, p. 14; Hume, Rough Notes, i. p. 216; Hume, Str. Feath. i. p. 310 (1873).

Nisaetus kieneri, Jerd. Ill. Ind. Orn. p. 5 (1847).

Lophotriorchis kieneri, Sharpe, Cat. Birds, i. p. 255 (1874).

Adult male. Length to front of cere 19·5 to 20·5 inches; culmen from cere 1·0 to 1·1; wing 14·2 to 15·5; tail 8·2 to 9·0; tarsus 2·7 to 3·0; mid toe 2·0 to 2·15, its claw (straight) 0·85 to 1·1; inner claw (straight) 1·3; height of bill at cere 0·5 to 0·55. Expanse (of one with wing of 14·5) 45·0; weight of the same $1\frac{5}{8}$ lb.

A great disparity in size exists betwen the sexes in this species, but males also differ much *inter se* in this respect. The above dimensions are taken from a fair series of Indian, Ceylonese, and Malaccan examples. The wings of four Ceylonese males examined measure 14·2, 14·5, 13·5, and 15·0.

Adult female. From Mr. Hume's Darjiling specimens ('Stray Feathers,' vol. i. p. 311). Length 24·0 to 29·0 inches:

* The article here referred to merely has these initials appended to it, and some doubt exists as to whether they refer to G. Sparre or Geoffroy St.-Hilaire. Mr. Sharpe has adopted the latter in his 'Catalogue of the Accipitres.' I observe that, throughout the 'Mag. Zool.,' St.-Hilaire either signs his name in full or uses the abbreviation "Geoffroy St.-H.;" and I think there is no reason to infer that had he been the author of the two descriptive articles (*Astur kieneri* and *Pica mystacalis*) in the volume for 1835, which are signed "G. S.," he would have used these initials instead of his usual signature. In the Roy. Soc. Catalogue, vol. v., these two identical articles are referred to as written by G. Sparre; and, in all probability, this is the correct determination of their authorship.

culmen 1·2; wing 17·0 to 17·5; tail 10·0 to 12·5; tarsus 3·0; mid toe 2·3, its claw (straight) 1·18; inner claw 1·5; height of bill at cere 0·65. Expanse 50·0.

An example from Sarawak in the British Museum, marked ♀, has the wing 13·0 and the tail 7·5.

Iris dark brown; cere yellow, in some greenish yellow; bill black, plumbeous at base; feet yellow; eyelid greenish yellow.

Lores, head, crest, back and sides of neck, upper surface, and wings dark blackish brown, almost black; crest of three or four stiffish, ovate feathers from 2·2 to 2·5 inches in length; inner webs of primaries (in the longer ones to the notch) whitish, crossed with narrow blackish bars; inner webs of secondaries more dusky, similarly barred; tail blackish brown, crossed with six or seven narrow smoky-brown but indistinct bars; in some examples the bars on the central feathers are nearly obsolete.

Chin, throat, and chest white, changing on the upper breast into the deep ferruginous of the lower parts, including the legs and under tail-coverts, and striped everywhere but on the chin and throat with lanceolate black shaft-streaks; under surface of tail greyish; under surface of primaries white, from the notch to the tip greyish, showing narrow black bars; lesser under wing-coverts pale rufous with black mesial stripes; greater secondary series and the primary row black, with white tips and fulvous edges.

Obs. In very old specimens the rufous colouring is very deep, and spreads upwards to the throat, the feathers being either tipped with it or washed with a paler hue than that of the breast. The extent of the shaft-streaks on the upper parts varies, the throat and chest having them in old birds. Mr. Bligh's male example (the first procured in Ceylon, and now in the Norwich Museum) has the rufous colouring extending no higher than the breast, and therefore represents a mature, but not an aged bird.

Young. I have not had an opportunity of examining this Eagle in its nestling plumage, and I therefore transcribe here the description given by Mr. Sharpe at page 458 of the 'Catalogue of Accipitres,' from a young bird in Lord Tweeddale's collection, which is evidently in its first dress:—"Above dark brown, the feathers lighter on their margins; wing-coverts coloured like the back, but the greater series with narrow white margins; hind neck paler than back, rufous-brown, with dark brown longitudinal centres, causing a slightly streaked appearance; quills blackish, with whity brown shafts; the secondaries paler brown, like the scapularies, all the quills narrowly banded with black, nearly obsolete on the primaries, but more distinct on the secondaries, especially underneath, where the lining of the wing is whitish; tail dark brown, whitish at tip, and crossed with seven or eight rather narrow bands of black.

"Crown of head dark brown, with tiny cream-coloured tips to the feathers; the occipital crest black, and 1·9 inch long; forehead and eyebrow very broad, rich creamy buff; cheeks and entire underparts creamy white, as also the tarsal feathers and under wing- and tail-coverts, the greater under wing-coverts with a few indistinct blackish bars."

Wing 13·3 inches.

The tippings of the head-feathers, margins of the wing-coverts, and creamy colour of the under surface testify to this bird being in nestling plumage.

An immature bird, apparently of the second year, in my collection is in the following plumage:—Head and upper surface very dark brown, the terminal portions of the feathers being blackish, but the basal parts paler brown than the centres; forehead at the edge of the cere, a narrow streak above the eye, and the basal portions of the head and nuchal feathers whitish; crest fully developed; lesser coverts on the point of the wing and along its edge with pale terminal margins; primary and greater secondary coverts and also the secondaries pale tipped, the former most clearly so; inner webs of the quills much as in the adult, but with the ground less white, being mottled between the bars; tail smoky brown, tipped pale, with narrower bars than in the adult, the subterminal one scarcely broader than the rest.

Chin, face, ear-coverts, and entire under surface with the under wing white; ear-coverts and sides of neck below them with terminal dark shaft-stripes; feathers at the sides of the breast and one or two on the chest with lanceolate dark brown shaft-stripes, surrounded by a wash of rufous; longer feathers of the flank-plumes dark brown, forming a prominent dark patch; thighs, tarsi, and under tail-coverts with rufescent feathers here and there; major under wing-coverts with blackish terminal patches. The rufous hue on the under tail-coverts is taking place by a change of feather; but there are some new feathers on the thighs of a darker hue. Wing 15·0 inches.

In the Norwich Museum are two young examples from "Java" and "Batchian" in this stage of plumage.

With age the darkening of the lower parts and the gradual advance of the rufous up towards the chest is very perceptible. An example from Malacca, in the British Museum, in the next stage to the above has the throat, chest,

and most of the breast white, the rufous hue appearing on the lower breast and extending downwards, while the shaft-stripes do not extend above the breast.

Obs. This interesting genus of Eagles, though comprising very few species, is widely diffused, taking both the Old and the New Worlds into its range. Until lately but two were known, the present and the large *L. isidorii* from Columbia, South America; recently, however, a third, *L. lucani* (Sharpe and Bouvier), has been added from the Congo river, S.W. Africa.

Distribution.—This rare and handsome Eagle has only lately been discovered in Ceylon; and the gentleman who has the merit of adding it to the avifauna of the island is Mr. S. Bligh, of Lemastota. The first Ceylonese example was procured by him in Kotmalie, a district at the base of the Nuwara Elliya ranges, lying at an altitude of about 3500 feet. It was shot on the 20th of October, 1873, and was a male in adult plumage. The next example was killed near Kandy at the latter end of 1875, and taken to Messrs. Whyte and Co.'s establishment, whence it passed into the Colonial Museum at Colombo; about the same time a young bird (above described) was shot near Peradeniya by a native, and procured from him by Mr. Whyte. Mr. Bligh met with another, which was seen close to his bungalow, on the 6th of June 1875, but evaded his pursuit; and in January 1876 I was equally unsuccessful in procuring another at Nalanda, a district to the north of the Matale hills, which are celebrated for the variety of Raptors found in their vicinity.

It has as yet, therefore, proved quite a hill species, which is in accordance with its habits in the Himalayas and elsewhere in the hills of Borneo and Malacca.

This Eagle is an inhabitant of the northern parts of India; but has not yet been detected in the south, which is the more strange when viewed in conjunction with its not unfrequent occurrence of late years in Ceylon; this, however, only substantiates the theory of the strong affinities of the Ceylonese avifauna with that of Malayana, in which region this Eagle is rather widely distributed.

According to Jerdon it is found in Central India, and Tickell obtained it near Chaibassa; but it has not been procured from there of late years; and Mr. Hume doubts if these specimens really belonged to the true *kieneri*, which was described originally from the Himalayas by Sparre, from a specimen at that time in Prince Essling's collection.

Along the southern slopes of the Himalayas it has been occasionally met with, particularly in Darjiling, Sikhim, and the eastern portions of the range; and in the collections made by Mr. Inglis for Mr. Hume in Cachar one example is noted. It is, however, rare in that district as everywhere else. Mr. Inglis writes ('Stray Feathers,' vol. v. p. 9):—"I was lucky enough to secure the only specimen of this handsome bird that I ever met with; I got it while on a fishing excursion on the Cheerie, close to the Cacharee Degoon Ponjee, at an elevation of 2000 feet."

From North-east India it extends southwards into Malacca, and thence into the islands of the archipelago. It has been procured in Java and Borneo, in the latter by Mr. Wallace, and from the former it has been sent to the Norwich Museum. From the island of Batchian, one of the Moluccas, there is likewise a specimen at Norwich, this locality (which is in lat. 0° 40′ S. and long. 127° E.) being at present the furthest known limit of its range into the Malay islands.

Habits.—The Rufous-bellied Hawk-Eagle inhabits forest-clad hills, frequenting, in search of its prey, open glades, valleys, clearings, and patnas. In Ceylon, it is therefore found about the coffee-estates, which are bordered by wood and studded with dead trees, the latter furnishing it with an advantageous post of observation. It is a bird of truly predatory disposition, and is as bold and courageous as it is handsome.

Mr. Bligh remarks, in his note on the capture of his bird, contained in the 'Journal of the Ceylon Asiatic Society' for 1874, that it was "sailing just above the trees in circles in a very buoyant and graceful manner, rarely flapping its wings. My little terrier," he says, "was frisking about some thirty yards off, and on arriving over the spot, the bold bird at once altered its flight, hovering in small circles with a heavy flapping of the wings, evidently with a view of examining the dog." He further remarks that when brought to the ground with a broken wing, "it put itself in an attitude of defence at once; and a formidable bird it looked, with beak open, head thrown back, wings spread, and talons ready for action, and its beautiful brown eyes looking so fierce."

Mr. Inglis, in his note on the shooting of a specimen on the hills of Cachar, bears the same testimony to its plucky nature, and says that it fought most fiercely while it was being secured. As observed by myself its flight was buoyant, but not very swift, resembling somewhat that of the Ceylon Crested Eagle (*Spizaetus ceylonensis*); its white chest, contrasted with the dark lower parts, is a conspicuous characteristic when the bird is flying overhead. This Eagle preys on birds and small mammals, being capable, however, of capturing an animal of no diminutive size, so strong are its talons and so bold its disposition.

ACCIPITRES.

FALCONIDÆ.

AQUILINÆ.

Genus NEOPUS.

Bill longer than in *Lophotriorchis*, more suddenly hooked at the tip, the festoon less pronounced; cere large, the nostrils oval and partially covered by the loral bristles. Wings very long and exceeding the tail when closed; the terminal portions of the longer primaries very concave beneath; 4th, 5th, and 6th quills subequal and longest. Tarsus slender, feathered to the toes, which are short, the inner nearly as long as the middle, the outer very short. Claws slightly curved; *the inner claw very long*, exceeding the hind; outer claw very short, not reaching to the tip of the middle toe.

NEOPUS MALAYENSIS.

(THE BLACK KITE-EAGLE.)

Falco malayensis, Temm. Pl. Col. i. pl. 117 (1824).

Aquila malayensis, Vig. Zool. Journ. i. p. 337 (1824); Schlegel, Vog. Nederl. Ind., Valkv. pp. 8, 49, pl. 3. figs. 1, 2 (1866).

Aquila malayana, Less. Traité, p. 39 (1831).

Ictinaetus malayensis, Blyth, J. A. S. B. xv. p. 7 (1846); Kelaart's Prodromus, Cat. p. 114; Layard, Ann. & Mag. N. H. 1853, xii. p. 99.

Neopus malayensis, Jerd. B. of Ind. i. p. 65 (1862); Hume, Rough Notes, i. p. 187; Wald. Tr. Z. S. viii. p. 34; Holdsworth, P. Z. S. 1872, p. 411; Legge, Ibis, 1874, p. 8; Sharpe, Cat. Birds, i. p. 257; Bourdillon, Str. Feath. 1876, p. 355.

Heteropus malayensis, Hume, Nests and Eggs, i. p. 32.

The Black Eagle, *Kite-Eagle*, in India.

Heugong, Bhot.; *Adavi nalla gedda*, Tel., lit. "Jungle Black Kite" (*apud* Jerdon).

Kalu-Rajaliya, lit. "Black Eagle," Sinhalese.

Adult male. Length to front of cere 25·0 to 27·2 inches; culmen from cere 1·35; wing 20·6 to 21·75, expanse 63·0 to 64·0; tail 12·2 to 13·5; tarsus 3·2; mid toe 1·6 to 1·7, its claw (straight) 1·1 to 1·2; inner claw (straight) 1·6, hind claw (straight) 1·45; height of bill at cere 0·55.

Adult female. Length to front of cere 28·0 to 29·5 inches; culmen from cere 1·37; wing 23·0 to 25·0, expanse 75·0; tail 13·5 to 14·5; tarsus 3·5 to 3·8; inner claw (straight) 1·7 to 1·9; height of bill at cere 0·6. Weight 3½ lb.

Obs. The chief distinguishing characteristic of this peculiar Eagle is its remarkable foot and straight claws, the inner of which is the longest, exceeding the hind by about 0·1 inch, which latter is just twice the length of the outer.

Iris hazel-brown; bill brownish horn-colour, paling into greenish at the cere; cere, gape, and base of lower mandible citron-yellow; feet gamboge-yellow.

Head and entire upper surface sooty black, darkest on the head, lesser wing-coverts, and scapulars, and paling into brown on the upper tail-coverts; entire under surface and legs blackish brown, blending into the black of the cheeks and hind neck; feathers of the head with spinous glossy shafts, bases of the loral plumes and a small space above them white; scapulars and outer webs of quills with a green lustre; bases of the inner webs of the longer primaries barred with white; on the remainder and those of the secondaries there are indications of bars slightly lighter than the ground-colour; concealed portions of the upper tail-coverts crossed with narrow incomplete white bars; tail with four or five interrupted bars, slightly paler than the ground-colour, the terminal one about $2\frac{1}{4}$ inches from the tip; on the under surface these bars show whitish, and mostly so on the lateral feathers, where they increase to seven; under wing-coverts uniform brownish black.

The amount of white about the lores varies in individuals, and a specimen from Ceylon in my collection has a small tuft of white feathers below the cheeks.

Young. In the nestling-plumage, as figured by Schlegel (*loc. cit*), the head, neck, and entire under surface are fulvescent buff, each feather with a central stripe of brown, the pale ground-colour darkening on the back and wings into blackish brown, and having the margins of the feathers buff.

Immature bird. Wing of an example in the British Museum 18·5 inches.

In this plumage the back, wings, and tail are but little paler than in the adult; crown almost uniform black, the feathers tipped with fulvous, which on the nape, hind neck, and behind the ears increases in extent, and gives those parts a striated appearance; the forehead and lores whiter than in the adult; lesser and median wing-coverts tipped pale; primaries as black as in the adult, the inner webs with narrow mottled bars of white as far out as the notch; bars of the tail-feathers narrower, closer together, and more numerous than in the adult, the terminal one nearer the tip; upper tail-coverts as in the adult; throat and fore neck deep brown, the feathers tipped with fulvous; breast, flanks, and thighs mingled with rufous and streaked and mottled with the brown of the fore neck; lower part of tarsi streaked and mottled with fulvous; under tail-coverts barred with the same; under wing-coverts buff, closely barred with irregular marks of blackish brown.

With age, as the pale striations and tippings of the upper surface disappear, the bars on the inner webs of the primaries diminish near the tips; the tail-bars likewise alter in character; but they are always perceptible on the central feathers in the oldest birds, and the bases of the primaries are never, as far as I have been able to examine specimens, without a few white bars. Mr. Sharpe observes, in his 'Catalogue,' that while the change to the adult plumage on the upper surface takes place by a partial moult, the alteration on the lower parts is acquired by the brown edgings of the feathers gradually occupying the whole of the web.

Distribution.—The Black Eagle is found both in the lowlands of Ceylon and the mountain-zone up to the highest elevations. In the low country it confines itself chiefly to tracts of forest and retired valleys in the vicinity of some rocky eminence, on which, in all probability, it breeds. I have seen it on several occasions in the Kurunegala district and about the Ambepussa hills; further south, in the more wooded portions of the Pasdun Korale and Saffragam, it is more plentiful, and in the hilly jungle-clad country between Galle and the southern mountain-range I have often seen it soaring round the forest-covered hills on the southern bank of the Gindurah, or gliding over the secluded valleys at the base of the Morowak Korale coffee-districts. In these latter it is not uncommon too. The endless jungles of the eastern side of the island, teeming with bird-life, form a grand refuge for these sable robbers; and I have observed them from the base of the Ouvah hills to the Friar's Hood forests, between which latter and the sea, at about an hour's walk from the Batticaloa Lake, I once shot a fine specimen. In the northern half of the island I have met with it as far up as the neighbourhood of Haborenna, near which the lofty cliffs of Rittagalla and the precipitous rock of Sigiri no doubt furnish it with a permanent residence.

In the Central Province it is tolerably common, confining itself to the higher peaks in the Kandy district and the high ranges surrounding the Nuwara-Elliya plateau. I have seen it at Horton Plains and at Kandapolla, near the sanatorium; but it is oftener met with on the Uva side between Nuwara Elliya and Madulsima than anywhere else in the hills.

The Black Eagle is found in most of the hilly wooded districts of India, but appears to visit certain localities for a time and then depart again, reappearing the following year. In the south it is found in the Travancore district and in the Malabar region generally, following the west coast to the district of Surat.

Mr. Fairbank says it is rare at Mahabaleshwar, and in the Deccan he has not observed it. In the Himalayas it ascends generally to an elevation of seven or eight thousand feet, and is more common there from September till April than during the hot season. Col. Irby states that he has procured it as high as 10,000 feet. Mr. Ball does not include it in his avifauna of Chota Nagpur, nor does it appear in the "First List of the Birds of Upper Pegu" ('Stray Feathers,' 1875). Mr. Brooks records it as rare above Mussoorie.

To the south-east of the Himalayas its numbers commence to diminish; it finds no place among the birds collected in North-east Cachar by Mr. James Inglis ('Stray Feathers,' 1877); and though it is recorded by Jerdon and other naturalists from Burmah proper, it does not appear to be common there. According to Schlegel it is found in Malacca, and Wallace notes its occurrence in Java, Sumatra, and Celebes; but in these islands it appears to be far from numerous.

Habits.—This fine, long-winged Eagle is, on account of the singular structure of its feet and its curious habits, one of the most interesting, but at the same time perhaps the most destructive of Raptors to bird-life in Ceylon. It subsists, as far as can be observed, entirely by bird-nesting, and is not content with the eggs and young birds which its keen sight espies among the branches of the forest-trees, but seizes the nest in its talons, decamps with it, and (as Mr. Bourdillon, in his article on the Travancore birds in 'Stray Feathers,' observes) often examines the contents as it sails lazily along. Furthermore, Mr. S. Bligh informs me that he once found the best part of a bird's nest in the stomach of one of these Eagles which he shot in the Central Province! Its flight is most easy and graceful. In the early morning it passes much of its time soaring round the high peaks or cliffs on which it has passed the night, and about 9 or 10 o'clock starts off on its daily foraging expedition; it launches itself with motionless wings from some dizzy precipice, and proceeding in a straight line till over some inviting-looking patna-woods, it quickly descends, with one or two rather sharp gyrations, through perhaps a thousand feet, and is in another moment gliding stealthily along, just above the tops of the trees: in and out among these, along the side of the wood, backwards and forwards over the top of the narrow strip, it quarters, its long wings outstretched and the tips of its pinions wide apart, with apparently no exertion; and luckless indeed is the Bulbul, Oriole, or Mountain-Finch whose carefully-built nest is discovered by the soaring robber.

Mr. Frank Bourdillon, in his "Notes on the Birds of the Travancore Hills" ('Stray Feathers,' 1875, p. 358), in which district this Eagle is not uncommon above 500 feet, remarks, "I have never seen it make any attempt to seize a full-grown bird, but have once or twice seen one carry off a nest in its claws, and examine the contents as it sailed lazily along. It is a very silent bird, and may be seen steadily quartering backwards and forwards along the side of a hill and in and out among the tree-tops."

It is, I think, worthy of remark that the long inner claws of this bird seem especially adapted for the work of carrying off loose and fragile masses, such as the nests of small birds, as they would naturally form its chief means of grasp when such an object was being held by both feet during the process of flight.

Concerning its habits in India, Jerdon writes the following account, which is confirmatory of what I have above stated:—"I never saw it perch, except for the purpose of feeding or on being wounded; and the Lepchas of Darjiling, when I saw this Eagle, said, 'This bird never sits down.' It lives almost exclusively, I believe, by robbing birds' nests, devouring both the eggs and the young ones. I dare say if it saw a young or sickly bird it might seize it; but it has neither the ability nor dash to enable it to seize a strong Pheasant on the wing, or even, I believe, a Partridge; and Hodgson, I fancy, must have trusted to a native partially ignorant of its habits, when he says 'that it preys on the Pheasants of the regions it frequents as well as their eggs.'

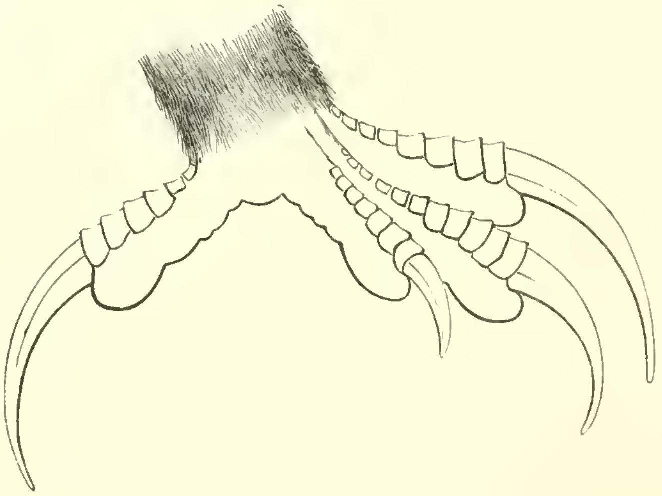
"I have examined several birds shot by myself, and invariably found that eggs and nestling birds had been alone their food. In these cases I found the eggs of the Hill-Quail (*Coturnix erythrorhyncha*), of *Malacocircus malabaricus*, and of some Doves (*Turtur*), with nestlings and the remains of some eggs that I did not know. I have seen it also, after circling several times over a small tree, alight on it and carry off the contents of a dove's nest. In India, doves, and perhaps some other birds, breed at all times in the year; and it may,

perhaps, obtain eggs or nestlings at all seasons, by shifting its quarters and varying the elevations; if not, it probably may eat reptiles; but of this I cannot speak from observation."

I have been assured by several gentlemen in the planting-districts that it attacks fowls, and carries them off from the poultry-yards; and Mr. Northway, of Deltota, has a fine pair stuffed by Messrs. Whyte and Co., which were killed in so doing. It is the opinion of some naturalists that it does not attack large birds; but this fact is conclusive, though it may only carry off poultry when much pressed by hunger. The voice of this species is a shrill, very long-drawn scream, resembling the cry of the Serpent-Eagle somewhat, but much more powerful, and when heard in the deep gorges of the mountain forests in the upper ranges is a wild and stirring note.

Nidification.—It is extremely difficult to obtain information about the breeding-habits of a species frequenting such wild haunts as the Black Eagle. My endeavours to trace even the whereabouts of an eyrie were futile, although, during the last year I was in Ceylon, I learnt that a pair were thought to nest in the high cliff above the Nuwara Elliya and Kandapolla road. In 1872 a pair frequented a ravine near the Galle and Akkuresse road; and I believe they were breeding in the neighbourhood, but I was unable to discover their nest.

Mr. Hume has received eggs from two nests, with their parent birds, and has no doubt that they were rightly identified. These eggs were taken in January in India, and, in all probability, our birds breed about the same time. The nests were situated on ledges on the face of cliffs, and contained respectively one and three eggs. They were nearly perfect ovals, devoid of gloss and rough in texture, and of a greyish-white ground; and the single egg was richly blotched and mottled with brownish red, while the other three contained only a few brownish specks at one end. They varied "from 2·5 to 2·68 inches in length, and from 1·88 to 2·02 inches in breadth."



Foot of *Neopus malayensis*.

SPIZAETUS KELAARTI,

ACCIPITRES.

FALCONIDÆ.

AQUILINÆ.

Genus SPIZAETUS.

Bill stouter, slightly shorter, and deeper than in *Neopus*; culmen curved much as in that genus, the festoon more pronounced; cere small. Nostrils large, oval, and directed obliquely upwards, and protected by the long loral bristles. Wings short and rounded; the 5th quill the longest, the 1st the shortest of all; tips of the secondaries falling short of those of the primaries by less than the length of tarsus. Tail long, rounded at the tip, exceeding the closed wings by more than the length of the tarsus. Tarsus long, but less than the tibia, feathered in some to the base of the toes, in others partly on the middle toe. Toes moderate, furnished at the tip with three transverse scales, the lateral toes subequal and slightly exceeding the hind toe; inner claw shorter than the hind. Head usually furnished with an elongated crest.

SPIZAETUS KELAARTI.

(THE CEYLON MOUNTAIN HAWK-EAGLE.)

(Peculiar to Ceylon.)

Spizaetus nipalensis (Blyth), Kelaart, Prodromus F. Zeyl. p. 96, and Cat. p. 114 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 98; Blyth, Comm. Jerd. B. of Ind. Ibis, 1866, p. 242 (in part); Sharpe, Cat. Birds, i. p. 267 (1874) (in part).

Limnaetus nipalensis, Hodgson, Jerdon, B. of Ind. i. p. 73 (1862, pt.); Holdsworth, P. Z. S. 1872, p. 411.

Spizaetus kelaarti, Legge, Ibis, 1878, p. 201.

The Beautiful Crested Eagle, Kelaart, Prodromus.

Rajaliya, Sinhalese, Central Province.

Ad. similis *S. nipalensi*, sed pileo minùs nigricante, strigâ gulari et fasciis mystacalibus valdè angustioribus, pedibus robustioribus et unguibus validissimis, sed præcipuè corpore subtùs pallidiore brunneo et fasciis transversalibus omnino albis, rachide quoque albâ distinguendus.

Adult female. Length to front of cere 29·5 to 31·0 inches; culmen from cere 2·0; wing 18·0 to 20·0; tail 12·0 to 13·0; tarsus 4·4 to 4·6; mid toe 2·7 to 2·8, its claw (straight) 1·3; inner claw (straight) 1·7; hind toe 2·0, its claw (straight) 2·05 to 2·1, circumference 1·4 to 1·5; height of bill at cere 0·81. Weight 6 lb.

Iris yellow; cere blackish; bill black, paling to blackish leaden at the base; feet citron-yellow, claws black.

Mature female. Back, scapulars, lesser wing-coverts, rump, and upper tail-coverts blackish brown, the scapulars and upper tail-coverts tipped with white; forehead, crown, crest, and ovate centres to the feathers at the sides of the occiput and hind neck black, the latter very broadly margined with light sienna, diminishing gradually towards the lower part of the hind neck; crest of 5 or 6 feathers, $3\frac{1}{2}$ inches in length and tipped with white; median and greater wing-coverts pale brown, darker near the tips, which are finely edged with whitish, except those of the inner feathers of the latter, which are rather deeply so; primaries and secondaries black, the latter tipped with white, and the whole crossed with obscure smoky-brown bars, which are white towards the base at their inner edges; tail blackish, tipped pale, with three pale smoky-brownish bands, and a fourth beneath the coverts, the subterminal one about 2 inches from the tip and about $1\frac{1}{2}$ inch in width.

Chin, throat, and fore neck creamy white, with a very broad, mesial, black stripe, and with two others, less clearly defined, passing from the gape down the sides of the throat, and spreading out over its lower part; cheeks and ear-coverts boldly striped with black, the edges of the feathers concolorous with the sides and back of neck; chest, breast, flanks, and all the lower parts, including the legs and under tail-coverts, sienna-brown, darkest on the flanks, thighs, and under tail-coverts; the feathers of the chest with wide and deep marginal indentations of white, and the breast, flanks, thighs, abdomen, and under tail-coverts barred with straight, complete bands of white, the *shaft* being of the same colour; bars on the thighs narrow, but everywhere else broad, the brown interspaces on the sides of the breast and on the under tail-coverts with their lower edges darker than the rest; tarsi pale brown, with whitish tips to the feathers; lesser and median under wing-coverts concolorous with the chest and narrowly barred with white; the greater series white, crossed with blackish-brown bars; under surface of the light portions of the quills and tail-feathers greyish white.

Obs. The above description is combined from the examination of several fully-sized females, exhibiting each a different amount of intensity in the colour of the crown and hind neck, but none of them possessing the extremely dark features characteristic of adult Nepaul birds, or any inclination to the very broad chin-stripe of these latter, though this character is variable in that species. The older the Ceylonese birds become, no doubt the darker would be the head, and the bolder the chin and moustachial stripes, although I do not think they would ever acquire the same degree of melanism as the Indian species (*Spizaetus nipalensis*).

I have unfortunately no data of the dimensions of any *ascertained* adult males; but the following of an immature bird, shot by Mr. Bligh, and the subject of the background figure in my Plate, will give some idea of the size attained by that sex.

Young male, apparently at the outset of the 2nd year:—Wing 16·3 inches; tail 11·75; tarsus 4·5; mid toe 2·3, its claw (straight) 1·4; hind claw 1·7. (Two presumed males, in the British Museum, of *Spizaetus nipalensis*, have the wings 17·0 and 17·3 respectively; and an ascertained male, recorded at p. 213 of 'Rough Notes,' measures 17·8, which, in view of the respective sizes of the females in the two races, will fairly represent that of adult males of *Spizaetus kelaarti.*)

Above brown, the back, scapulars, and wing-coverts conspicuously margined with white as in the smaller species (*Spizaetus ceylonensis*); crown with the centres of the feathers dark brown, paling into fulvous at the margins; rest of the head and hind neck paler, the edges of the feathers pale fulvescent; crest well developed, the feathers black, deeply tipped with white; greater wing-coverts pale brown, with much white on the inner webs and at the tips; primaries and secondaries blackish brown, with paler smoky-brown bars than in the adult; the inner webs white towards the base; tail blackish brown, crossed with four pale brownish bands; the black interspaces and terminal band narrower than in the adult; tip whitish.

Chin, throat, and fore neck white; the chin unstriped, a few blackish-brown drop-shaped marks on the throat, spreading laterally over the fore neck; chest-feathers pale sienna-brown, indented at the sides with bar-like spots of white; breast, flanks, abdomen, and under tail-coverts pale brownish, barred with complete white bands, wider than the brown interspaces, which are darker on the flanks than on the centre of the breast; thighs barred more narrowly than the breast, the brown hue concolorous with that of the sides; tarsi pale brownish, the feathers tipped with whitish; under wing-coverts white, spotted with sepia-brown.

Obs. I discriminated (*loc. cit.*) this Hawk-Eagle from the Indian species (*Spizaetus nipalensis*), having made a careful examination of all the examples to hand in the British, Indian, and Norwich Museums, to aid me in my conclusions; and the diagnosis of the distinctive characteristics of the two species, given in my article, will, I think, be sufficient to establish the Ceylonese bird as a good *subspecies* or local race, which I have named after Dr. Kelaart, who first brought to notice the existence of the species in Ceylon. For the benefit of my Ceylon readers and others who have not seen my remarks in 'The Ibis,' I now recapitulate in substance the remarks I there made.

The Ceylonese bird differs from the Indian in the peculiar barring of the entire under surface from the throat downwards, and in its very large feet and claws, the latter of which are especially noteworthy. Furthermore, it does not appear to acquire the black head and cheeks and the very broad black throat-stripe which are characteristic of *Spizaetus nipalensis*. In this latter bird the chest is usually dark brown, the centres of the feathers consisting of a broad dark brown "drop" or stripe, which pales off into an unbroken fulvous-brown margin, while in others the whole feather is sepia-brown, with slight marginal indentations of white; this coloration is continued in most examples down to the breast, about the middle or upper half of which the barred feathers commence, and in which the white band is more or less irregular and interrupted at the shaft by the brown hue of the feather, the division varying from an exceedingly fine margin on each side of the *dark* shaft to a broad space of about $\frac{3}{10}$ inch. In many birds these bars do not even correspond or oppose one another on each side of the shaft, amounting in reality to nothing more than deep indentations of white. The thighs and under tail-coverts in the Nepaul bird

are, however, barred in the same complete manner as the breast and flanks of the Ceylonese, but the perfect bar never seems to go any higher than the tibials.

In the young of the Indian species the breast is marked with drop-shaped streaks, the bars being *confined to the flanks* and under tail-coverts: the markings are very dark as a rule, particularly on the chest and upper breast. It is, I may here remark, a very variable bird in its plumage, old birds differing *inter se* as much as young ones; and out of a score I have examined, no two were exactly alike. Five adult Ceylonese examples, which I have had the opportunity of examining, exhibited precisely the same character of barring over the whole under surface.

Lastly, as regards the massive foot and immense claws, which are characteristic of *S. kelaarti*, I have been unable (as will appear by a glance at my table of measurements, in 'The Ibis,' of seventeen examples of *S. nipalensis*) to find any Indian example of this latter species with the hind claw exceeding 1·9 inch; whereas in the Ceylonese bird it attains the great size of 2·1 inches, this measurement being taken, in accordance with my usual custom, across the arc from the tip to the exterior edge of the base.

Distribution.—This magnificent Eagle, the noblest representative of its tribe which Ceylon possesses, is peculiar to the island, and was first recorded by Dr. Kelaart from a bird procured by him near Badulla, mention of which is made at page 96 of his 'Prodromus,' as follows:—"This elegant crested Eagle is occasionally seen in the highest mountains. The only specimen we succeeded in procuring was shot on a mountain 4000 feet high, near Badulla." From that time until comparatively recently it does not appear to have been noticed by naturalists in the island; and so late as the year 1872, Mr. Holdsworth was unable to record any further instances of its capture since that of Kelaart's bird, although, doubtless, in the course of opening up the forests of the Central Province for the planting of coffee, the species may have been killed not unfrequently, and not recognized by its captors as any thing valuable.

It is entirely a mountain species, having its headquarters in the wild and little-trodden forests of the main range and other isolated lofty jungles, such as Haputale and the Knuckles, whence it descends to the neighbouring coffee-estates in pursuit or search of its quarry. In so doing it has lately been shot so frequently that it can no longer be considered one of our very rare Eagles. Not many years after the establishment of Messrs. Whyte and Co.'s business as naturalists and collectors, specimens began to find their way to them, and in 1875 I had the opportunity of examining two examples preserved in their collection. In March, 1876, a magnificent bird was shot by Mr. Bligh on the Catton Estate, Lemastota, and in the same year five examples were procured by Messrs. Whyte and Co., belonging to gentlemen in the surrounding planting districts. Three of the finest of these were obtained as follows:—(1) by Mr. A. Thom, on Oudasgeria Estate, Matale; (2) by Mr. E. Nicol, Kitlamoola Estate, Deltota; (3) by Mr. Gould, Maturata—all at elevations ranging from 2000 to 4500 feet. About the same time a sixth specimen was shot by Mr. Thurston near Nuwara Elliya, but unfortunately was not preserved.

Habits.—This fine Eagle frequents the retired recesses and forests of mountainous country, above an elevation of 3000 feet or thereabouts, probably not dwelling permanently or breeding below 4000 feet, although it may frequently be met with considerably beneath these altitudes when in search of food. Though bold and courageous in its disposition as a Raptor, it is very shy and wary of man, rarely coming beneath his notice, except when caught in the act of making a raid on the poultry-yards of the planters or seizing a hare on the mountain patnas. The first-named habit has on nearly all occasions led to its capture of late years in the planting districts. One of the finest examples above noticed was shot by Mr. Nicol after it had missed its mark at a fowl and settled on a tree near his bungalow; and Mr. Bligh informs me that the magnificent example which he shot at Catton had its talons covered with the fur of a newly slaughtered hare.

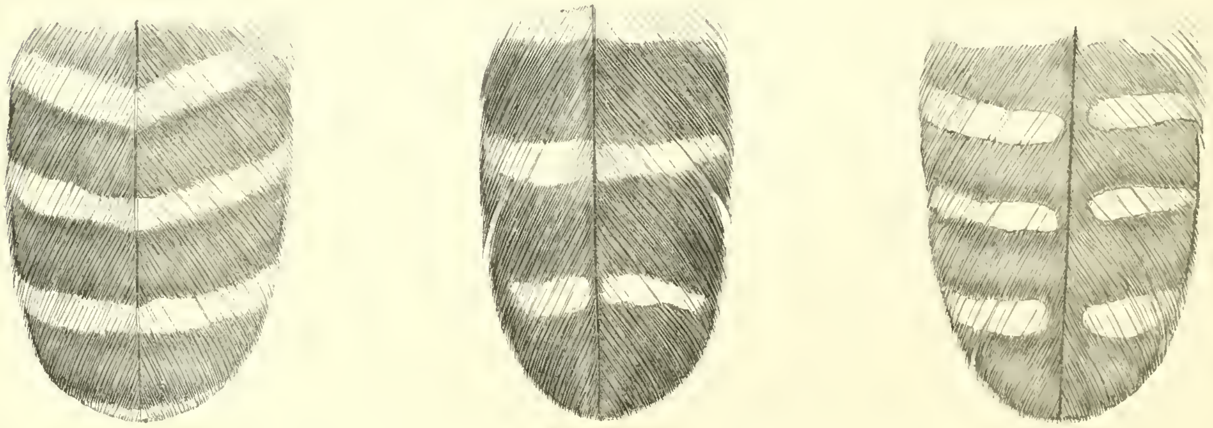
It is occasionally seen about Nuwara Elliya, where the existence of isolated cottages and houses, with their accustomed live stock, is a weighty attraction for it; it is quite powerful enough to be capable of carrying off the largest inmate of the poultry-yard, and, indeed, could make quick work with a moderately-sized lamb, were such to be found among the possessions of the fortunate owners of the many pretty bungalows which dot the plain of Nuwara Elliya. Its powers of flight and skill in catching game must be quite equal to those of its Himalayan relative, of whom Captain Hutton, as quoted by Mr. Hume in 'Rough Notes,' says, "it is most destructive to pigeons, fowls, and game." Mr. Thompson likewise writes of this bird:—"It feeds much on Pheasants, Hares, Black Partridge, Monaul and Cheer Pheasants, and sometimes on young deer."

Our bird may now and then be seen perched on the dead trees which stand in new coffee-plantations or upon the half-leafless ones peculiar to some of the higher patnas in the main range. Its flight is similar to that of the smaller low-country bird; and I have seen it quietly beating round the edges of the woods on the Horton Plains, probably on the look-out for the large black Squirrel (*Sciurus tennantii*), the "Kaloo Dandoleyna" of the Sinhalese, and which animal, I have no doubt, is often preyed upon by it. The note of this species is a loud scream, somewhat resembling that of *S. ceylonensis*.

[Since this article was sent to the press, I have received the following interesting note on this species from Mr. Bligh. Writing from Haputale, where the bird seems to be tolerably common, he says, "I often see the bird on the wing: now I know the species well, and I believe it to be nearly as common as *S. ceylonensis*; but they do not hawk for their prey so low down as the latter, which often skims through a valley of coffee within gun-shot of the ground, indeed often flies from one high stump to another, whereas the other would boldly sweep through the valley at a much greater elevation, and now and then, if really looking for prey, take a large sweeping circle. Lately I had the pleasure of seeing a pair of these birds on the wing together with a *S. ceylonensis*. I could easily distinguish the species; the small one, for some reason, kept above the others, and eventually soared away out of sight, as if he did not relish the neighbourhood of his powerful relations."

Nidification.—The nest of this species has never yet, to my knowledge, been found. The large tracts of forest which still clothe portions of the Nuwara-Elliya plateau, and stretch from the Horton Plains to the Peak, furnish it with a secure refuge in which to rear its young. It doubtless breeds on trees, nesting in a similar manner to the next species.

In the Plate accompanying this article, the figure in the foreground is taken from a magnificent female bird, mature, but not quite adult, for the possession of which I am indebted to Mr. Gould, of Maturata. The second figure is that of the young male described in this article, and for the loan of which I am indebted to the kindness of my friend Mr. Gurney, coupled with the civility of the authorities of the Norwich Museum, who loaned the specimen to me for the purpose of figuring. Mr. Keuleman's talented pencil has delineated this bird in the act of reposing on one leg, so characteristic of these Eagles.



Spizaetus kelaarti. *Spizaetus nipalensis.*

The above woodcut of the *adult* breast-feathers of this Eagle and those of *Spizaetus nipalensis* shows the distinctive characters of marking in the two birds.

$\frac{2}{5}$

SPIZAETUS CEYLONENSIS.

SPIZAETUS CEYLONENSIS.

(THE CEYLON HAWK-EAGLE.)

(Peculiar to Ceylon?)

Falco ceylanensis, Gmelin, S. N. i. p. 275 (1788).
Falco cristatellus, Temm. Pl. Col. i. pl. 282 (1824).
Spizaetus limnaetus, (Horsf.) *apud* Layard, Ann. & Mag. Nat. Hist. 1855, xii. p. 98; Kelaart, Prodromus, Cat. p. 114; Blyth, Cat. B. Mus. Asiat. Soc. Beng. (var. β) p. 25; id. Journ. Asiat. Soc. Beng. 1852, vol. xxi. p. 352.
Limnaetus cristatellus, Jerd. B. of Ind. p. 71 (in part); Holdsworth, P. Z. S. 1872, p. 411; Legge, Ibis, 1874, p. 9, and 1875, p. 277.
Spizaetus cirrhatus, Sharpe, Cat. Birds, i. p. 269 (in part).
Limnaetus ceylonensis, Gurney, Ibis, 1877, p. 431, et 1878, p. 85.
The Ceylonese Crested Falcon, Latham, Gen. Syn. i. p. 80 (1781).
Autour cristatelle, Temm. Pl. Col. 282.
The Crested Eagle and *The Hawk-Eagle* of Europeans in Ceylon.
Rajaliya, Sinhalese.

Ad. similis *S. cirrhato*, sed minor: alâ vix 15·2 unc. longâ: cristâ occipitali 3 vel 4 unc. longâ: pedibus flavis: iride flavâ.

Adult male and female. Length to front of cere 21·5 to 23·5 inches; culmen from cere 1·1 to 1·25; wing 13·8 to 15·2, but rarely exceeding $14\frac{3}{4}$; tail 9·0 to 10·5; tarsus 3·5 to 3·8; middle toe 1·8 to 2·0, its claw (straight) 0·85 to 1·0; height of bill at cere 0·5 to 0·56. Expanse 46 to 50. In the female I find no constant excess in size in the above measurements, taken from a series of fifteen examples; one of that sex measures 14·2.

Iris leaden grey with a tinge of yellow, pale straw-colour or golden yellow; cere dark leaden, in some with a greenish tint above; bill dark plumbeous, black at the tip, pale bluish at the gape and base; feet lemon-yellow or greenish yellow; claws black.

Obs. As will appear from the above, this Eagle is a bird of uncertain character in the coloration of its iris. It is likewise so in its plumage, there existing both a dark and a light phrase, of which the latter, I think, contains the larger birds. To the dark form I will give precedence in this article, as I am able to furnish a more complete sequence of changes than in the pale.

1. *Dark form, old bird.* Head and hind neck dark tawny, the centres of the feathers blackish; a crest of five or six elongated black feathers tipped with fulvous; back, scapulars, and wing-coverts blackish brown, the feathers slightly paler at the margins, the coverts edged with tawny fulvous, blending gradually into the dark centres of the feathers and more conspicuous on the greater series than on the rest; lesser coverts pervaded with an ashen hue; primaries and secondaries deep brown, with the terminal portions and a series of bars across both webs black, the basal portions of the inner webs white; tertials paler brown than the secondaries; rump and upper tail-coverts dark wood-brown; tail dark ashen, crossed with three black bands, one at the coverts, another at the centre, and a third at the tip, about $1\frac{1}{2}$ inch in width, having an interspace above it of about 2 inches wide.

Loral plumes and a superciliary streak blackish; cheeks and moustache boldly streaked with black, passing into the blackish brown of the ear-coverts; throat white, with a broad black chin-stripe, spreading over the fore neck and chest into a series of blackish "drops," paling into brownish at the margins of the feathers: chest and under surface brownish rufescent, the bases and sides of the chest-feathers white, and each with a slaty-black central stripe vanishing on the lower parts into the dark smoky-brown ground-colour; on the flanks, abdomen, and under tail-coverts the feathers have white bases, which show here and there, and disturb the uniformity of the ground-tint; thighs paler than the abdomen and cross-rayed with obscure fulvous; tarsi brownish fulvous; under surface of tail greyish; under wing-coverts whitish, dashed with tawny brown; greater series white, with terminal black spots.

The above is a description of the example now at the Zoological Gardens, aged six years, which is by far the darkest bird, particularly as regards the under surface, which I have ever met with. Its iris is *very* pale straw-colour.

Mature bird. At about three or four years of age, in a stage of plumage in which most dark birds are met with, the head and hind neck are more or less sienna-brown, with the centres of the feathers blackish, least so on the hind neck; on the forehead and above the lores the narrow feathers are pale-edged; crest, which is sometimes $4\frac{1}{2}$ inches in length, black, conspicuously tipped with white, the shorter feathers being blackish brown, paling into rufous at the white tips; back, scapulars, and wing-coverts deep glossy brown, paling off at the margins into a tawny hue, the greater coverts with less of the dark brown central hue, finely edged greyish, and with the concealed portions of the bases white; winglet and primary-coverts, the quills and secondaries dark brown, barred and terminated with black, much as in the above, but with more white on the inner webs, and with the tips of the secondaries whitish, a fulvous patch on the outer webs of the longer primaries opposite the notch; tertials wood-brown, paler than the scapulars; rump and upper tail-coverts of a similar hue; tail smoky brown, tipped white and crossed with four blackish bands, the subterminal one equal in width to the preceding interspace, the next two much narrower, and the basal one generally incomplete; on the lateral feathers there is an additional pale basal bar, and the interspaces are mottled with white.

Cheeks and the sides of the neck beneath them boldy streaked with blackish, the edges of the feathers being white; ear-coverts concolorous with the hind neck. Chin, throat, and under surface white, contracted at the centre of the fore neck between the tawny hue of its sides; a narrow blackish-brown chin-stripe passing down to the chest, from which to the abdomen each feather is centred with a broad drop-shaped dash of blackish brown; on the abdomen and flanks these expand until they cover the terminal portion of the feathers; the lower flank-plumes blackish brown, forming a large dark patch; under tail-coverts dark brown, usually tipped with white; thighs and upper part of tarsus a more rufous-brown, paling into buffy white at the feet; under surface of tail and of the quill-interspaces whitish; bases of quills beneath pure white; under wing-coverts white, dashed and striped in places with blackish brown, those beneath the ulna centred widely with rufous-brown.

In these birds I have invariably found the iris yellow, which is the normal colour, I imagine, of the eye in the adult.

*Young**. Nestling clothed with white down, with the crest-feathers plainly indicated by three or four attenuated downy shafts; the wing-coverts, scapulars, and quill-feathers on first appearing are fulvous-brown, deeply tipped with white; the tail-feathers are similar, and the whole darken considerably in a short time, the hue of the interscapular feathers being deeper than that of the rest.

Nestling plumage at 3 months. Iris leaden grey; bill dusky plumbeous, blackish at the tip; feet light lemon-yellow.

Head, back, and sides of neck with the ear-coverts light sienna-brown, edged with whitish; crest-feathers blackish, deeply tipped with white; back, scapulars, and lesser wing-coverts dark sepia-brown, the scapulars broadly tipped with white, and the back feathers margined, terminally, with rufous-grey, the bases being paler brown than the rest; median wing-coverts mostly white, with a longitudinal patch of brown; greater series broadly margined with white, the outer webs being a paler or fawn-brown; primaries and secondaries brown, the former the darker in hue, tipped with white and crossed with narrow bars of black, vanishing near the internal edges, which are white; first primary and terminal portion of the long ones almost uniform blackish; rump and upper tail-coverts fawn-brown; tail umber-brown, with a deep white tip and five or six narrow bars of blackish brown, the subterminal one slightly broader than the others, and the light interspaces, as in the quills, showing white beneath.

A thin white line from nostril over the lores; loral plumes blackish; lower part of cheeks, throat, and under surface pure white, dashed on the sides of the chest and breast with light sienna-brown "drops," those on the flanks being slightly darker and coalescing into a patch at the lower part; belly, thighs, and under tail-coverts dashed with pale brown and tipped with white; tarsi white. The extent to which the under surface is marked in this stage varies. The "drops," however, darken after the space of two months, as do also the feathers of the head and hind neck, which at the same time acquire darker mesial stripes; the brown of the back and wings also becomes more intense, and the bird is then in the normal plumage of the first year, with a long crest measuring from 3 to 4 inches.

At the second moult the example under consideration darkened on the head and hind neck, the crest remaining the same; the white of the wing-coverts diminished in extent, and the tail underwent a considerable change, the number of bars on the central feathers being reduced to four of greater width than the last, especially the terminal one, which was preceded by an equally broad interspace, the chest "drops" increased in number and in intensity, and the lower parts became more covered with brown; the dark patches on the white under wing-coverts were also more numerous.

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* These changes of plumage are described from observation, during youth, of the above living example, as well as from notes on other immature birds in my collection.

In the third year the upper surface continued to darken, the back became more uniform in hue, the white on the wing-coverts diminished, but the tail remained much the same, except that the brown was more cinereous in its tint; the crest, however, was almost entirely absent, but this was doubtless an abnormal characteristic; on the under surface a faint chin-stripe developed itself, and the coloration of the cheeks altered, becoming striated with dark shaft-lines, and each feather of the breast and under surface had a "drop" of umber-brown, those on the flanks completely covering the feather, while the abdomen, thighs, and under tail-coverts became uniform brown; under wing-coverts dashed with brown.

Iris during these years pale grey, without a sign of yellow in the coloration.

In the fourth year the "drops" on the under surface darkened, the marking of the tail altered, and the lower parts were more completely covered with brown; the crest was much shorter than it was in the second year, but otherwise the bird was in the plumage described above as mature, with the exception that the iris was still leaden grey.

No change took place after this until the autumn of the fifth year, when the bird commenced to moult several months after the time*, and assumed the fuliginous plumage in which it has been above described.

2. *Pale form.* Iris greenish grey; pale slate-grey; greenish grey faintly tinged with yellow. Head, back, and sides of neck tawny brown, the centres of the feathers black and broadest on the crown; crest as in the *dark form*, with the longer feathers boldly tipped with white and the shorter with rufescent greyish; major portion of the feathers of the back, scapulars, and lesser wing-coverts blackish, paling off at the margins and exposed bases into fulvescent brown, with the tips paler still; bases and most of the inner webs of the median and greater coverts white, showing most on the former, and the terminal portions blackish brown at the centre; rump, upper tail-coverts, and tertials pale brown, the tips of the coverts, in some, whitish; secondaries dark brown, barred and edged internally with white, as in the other phase; primaries and tail the same, but with a large fulvous patch at the quill-notches; cheeks and ear-coverts concolorous with the sides of the neck; the lower part of the face striated with dark brown; chin, throat, and entire under surface down to the abdomen white.

No chin-stripe; centres of the chest- and breast-feathers rufous-brown, many of them with dark shaft-lines, and on the flanks and sides of breast with patches of dark brown; a dark brown patch on the lower flank-plumes; under tail-coverts and thighs rufous-brown, the white bases on the latter giving them a chequered appearance; tarsi buffy white, dashed with the hue of the thighs; under wing-coverts white, the primary series with dark brown terminal patches; under surface of primaries white as far as the notch, that of the secondaries for two thirds of their length.

Obs. The above is a description of the oldest example in this phase of plumage that I have been able to procure. I obtained it on the shores of the Kanthelai tank, and judging by the bars on the tail, which are three narrow ones, separated from a broadish terminal one by an interspace of equal width, it is only in the third year. Another example, of apparently similar age, has the cheeks whitish, streaked with brown lines, but no chin-stripe; there is a series of dark shaft-stripes on the chest, but the lower parts are less clothed in brown than in the aforementioned. It is in the above phase of plumage that by far the greatest number of examples are procured in Ceylon.

Young (bird of the year). Wing nearly equal to that of the adult. Iris leaden grey or pale slate-colour, sometimes tinged with greenish; in one example pearly white; cere and gape bluish leaden; bill blackish at the tip.

Forehead, crown, back, and sides of neck tawny buff, the feathers in some with dark shaft-lines, in others entirely without any dark coloration; crest as in the dark bird; on the lower hind neck the brown terminal centres gradually develop into the dark brown of the back, scapulars, and wing-coverts, which are margined with tawny and tipped with whitish; on the median coverts there is much more white than in the mature bird, in some examples the entire feathers being uncoloured, with the exception of the terminal portion of the outer webs, and form an extensive white patch across the wing; first primary uniform blackish brown as in the older bird; upper tail-coverts pale brown, tipped with white; tail smoke-brown, tipped with white and crossed with five narrow bars of blackish brown, the subterminal one broader than the rest; lateral feathers white internally and with an additional bar.

Entire under surface pure white; the pale rufescent feathers of the side neck encroaching on the throat, and a few dashes of the same hue on the sides of the chest, flanks, and belly; thighs and under tail-coverts shaded with pale rufescent brown, the feathers tipped with white; tarsi washed with the same in some, pure white in others;

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* The moulting-time was a month later every year, a circumstance which apparently was caused by the natural want of vigour consequent on the captivity of the bird.

under wing-coverts white, the primary series spotted with dark brown, and the lining of the ulna washed with rufous-brown.

Obs. The Crested Hawk-Eagle of Ceylon is a miniature representative of the peninsular Indian species *S. cirrhatus*. Gmelin recognized Latham's Ceylonese Crested Falcon as a distinct form, and described it (*loc. cit.*) under the name of *Falco ceylonensis*; but subsequent naturalists, overlooking its smaller size, have treated it as one and the same with its large ally. Mr. Gurney refutes this idea with reason, as will be seen by reference to his remarks on the species ('Ibis,' 1877, p. 430). The maximum size which the insular bird attains in the wing is 15·3 inches, a measurement representing the minimum of *cirrhatus*, it being, however, at the same time about 2 inches below the average of the Indian species. I am not aware that the latter acquires the fuliginous plumage of *ceylonensis*; and the light phase of this is, moreover, paler than the immature dress of the Indian bird, which appears to partake somewhat of the characteristics of the *mature* form above described. I have examined a large series, and have found them all less pale on the head than Ceylonese young birds, and many of them possess the chin-stripe and striated cheeks unknown in our buff-plumaged young. It is possible that *ceylonensis* may prove not to be peculiar to Ceylon, Mr. Hume having described a small bird from Travancore as *Spizaetus sphinx*, which may, when a sufficient series is obtained, prove identical with it as a resident in S. India, or, should it turn out to have been a straggler, demonstrate the fact that *Spizaetus ceylonensis* strays over to the Indian coast from North Ceylon.

The dimensions of *Spizaetus sphinx* ('Stray Feathers,' vol. i. p. 321) are as follows:—" Length 22 to 23 inches; wing 14·1; tail 10·2; tarsus 3·9; mid toe and claw 2·5 (nearly)."

The upper plumage appears to bear a great resemblance to melanistic examples of the Ceylonese birds; "the whole back, top, and sides of the head (excluding the crest), back, and sides of the neck, a pale, slightly rufous-brown, each feather with a blackish-brown shaft-stripe." The lesser lower wing-coverts are "dull rufous, brown-shafted, more or less white-edged; the rest white, very broadly *barred** with deep brown." In this the species seems to differ from *S. ceylonensis*, as also in the coloration of the throat, which is described as follows:—" Chin and throat white, with one central and *two lateral blackish-brown streaks, which unite at the base of the throat* at the front of the neck; below this for about an inch *dull rufous-brown, like the sides and the back of the neck*; the breast white; the feathers with huge dark brown drops, edged paler towards the tips; sides, abdomen, lower tail-coverts, flanks, and exterior tibial plumes a nearly uniform, somewhat pale umber-brown, most of the feathers with inconspicuous very narrow whitish tips; interior tibial plumes and tarsal feathers pale dingy yellowish brown, paling most towards the feet."

Distribution.—The small crested Eagle of Ceylon is chiefly a low-country bird, and is more or less dispersed throughout the maritime provinces and the interior jungles of the island. In the Eastern Province it is located in greatest force, and thence northwards it occurs principally along the coast, near salt-lakes and open tracts of land, to the delta of the Mahawelliganga and the district lying between Tamblegam and Kanthelai tank, where it is again more common than immediately to the south of the Virgel. To the north of Trincomalie it is found in the open woods bordering the continuous salt-lakes of that part of the coast, and in the interior is met with generally in the vicinity of the tanks of the Vanni. Layard found it at Pt. Pedro; but it is on the whole a scarce bird in the Jaffna peninsula. It occurs sparingly throughout the west of the island to the north of Negombo, but it is decidedly scarce between that place and Kalatura.

In the wooded districts interspersed with paddy-cultivation, which form the south-west corner of the island, it is more common than in the Western Province, and again further east, beyond the Morowak Korale ranges, it becomes more numerous still, frequenting the low-lying jungles between Hambantota and the Badulla mountains. In the Kandyan Province it is not unfrequent up to an elevation of 4000 feet, occurring chiefly in the Knuckles ranges, in Medamahanuwara, Dumbara, and southwards to Ambegamoa, as also round the eastern slopes of the Maturata district into Uva proper and Madulsima. Mr. Bligh has obtained it in Kotmalie and in the spurs of the Haputale range, and Mr. Holdsworth speaks of having seen it at Nuwara Elliya†. Layard mentions (*l. c.*) that Kelaart obtained it at Nuwara Elliya; but the latter does not include it in his list of birds from that locality ('Prodromus,' p. xxix).

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* The italics are mine.

† I have never seen any specimens of this bird from the Nuwara-Elliya plateau. Mr. Holdsworth speaks of the Eagle that he observed as soaring in "wide circles, with a squealing cry." This is a marked characteristic of the Serpent-Eagle (*Spilornis spilogaster*), whereas the Crested Eagle rarely soars, and seldom utters its cry on the wing. I think, therefore, that Mr. Holdsworth may have been mistaken in his identification.

Habits.—This noble little Eagle frequents open forest, the borders of heavy jungle, detached woods, cheenas, and scrubs interspersed with large trees. About such localities it prowls with a slow, though buoyant flight, being chiefly about in the mornings and afternoons, and searches the open ground for its favourite food, the large *Calotes* lizard. When satisfied with the result of its excursions it perches on solitary dead trees or exposed limbs of others in the forest, and enlivens the wilds with its complaining cry, which may be syllabized as *kre kre kre kreee, kre kre kre kreee,* quickly repeated, and continued to a wearisome extent. This is, however, the cry of the young or immature bird, and develops in the adult into a prolonged note in a different key, and in which the principal accent is laid on the second syllable, resembling the sounds *kre-krēēē-kre-kree.* This is as invariably the voice of the brown, dark-marked birds as the former is of the light-plumaged individuals.

Of the lonely cheenas of the Eastern Province, studded with blackened trees and stumps, and scantily covered with a straggling crop of "Kurrukkan" (*Eleusine indica*) or a few wild cucumbers, this Eagle forms a marked characteristic; perched motionless on the limb of a tall tree, it remains for a long time piping out its monotonous cry, which is perhaps answered from another cheena a little distance off. At such times it is seated bolt upright on one leg, with the other drawn up beneath its breast-plumes, its erect crest and its eyes staring proudly before it; and so regardless is it of all around it that it may easily be approached in the open from behind to within an easy shot.

It is a bold and courageous bird in its disposition, as is amply testified to when it is kept in confinement; but as regards its prey it captures nothing larger than jungle-fowl, squirrels, and other small mammals, and feeds more on lizards than any thing else. It is exceedingly active and quick-sighted, and rarely misses any thing upon which it pounces. It is quite capable of capturing a bird on the wing, and in the Kandy district it is often shot carrying off poultry from the planters' bungalows; in the villages of the Vanni it also commits considerable havoc in the same way about the houses of the natives. Layard, in his notes (*vide suprà*), speaks of one darting at a wounded Sparrow-Hawk which he had tied to a post in the verandah of his bungalow. Its flight is not, as a rule, swift, but performed with steady flappings of the wings; it rarely soars—and when it does, mounts in quick small circles for a short time and then flies off at a tangent.

The habits and disposition of birds of prey are well observed when they are in confinement; it may not, therefore, be out of place to subjoin here a short account of one of these Eagles which I reared from the nest and had five years in my possession, and which is now personified in the noble little representative of the species in the Zoological Gardens. When a chick he was fed upon lizards, which were first given him cut up; but as soon as he could stand up, he quickly learnt to devour them in the orthodox way, beginning at the head and finishing up at the tail, which he always swallowed whole. As it grew older, whenever food was thrown to it, and more particularly in the case of small birds or any thing which it was fond of, it seized the prey with both feet, squatted down on the tarsi, and spread forward its wings in a line with its head, at the same time expanding its tail and completely covering up its prize from view; it would then droop the head, looking at the coveted morsel, and commence uttering its querulous note, endeavouring to flap its wings when approached by any one, and altogether presenting a very singular appearance. This was its habit throughout life, and was more particularly practised when in company with other Raptors in the same aviary, being evidently its mode of shielding its prey from outward attack. He had the same method of standing on one leg and resting the other on the knee-joint, with the tarsus thrust out from the perch and the toes clenched, that I have observed in other Eagles, and which is no doubt a muscular exercise.

He would now and then seize a stone and fly round the aviary with it, or at other times endeavour by main force to tear up a clod from the floor of his aviary. During his first year he was a timid bird, sometimes retreating into a dark corner or "cot," inhabited by a Wood-Owl (*Syrnium ochrogenys*), and stretching himself out would remain there for hours; he likewise frequently allowed his nocturnal companion, who fed as much by day as by night, to rob him of his meat. Very different, however, was his nature after the first moult; he then developed both in muscular strength and courage, and became a bold and fierce little tyrant, commenced by attacking his companion, and finished by killing him outright. He displayed great agility and power of flight, one day darting up and seizing, through the bamboos of the aviary-roof, a Magpie-Robin that was perched upon it; at other times he would dart from his perch and catch, in the air, birds, rats, and other food thrown in to him. He was fond of bathing, and invariably stood out in heavy showers of rain, in which he

would expose himself to a thorough drenching, and then dry himself in the sun with his wings expanded. The most singular and interesting point in his disposition was his manifest display of anger and excitement, accompanied by a particular note of displeasure, consisting of a shrill scream, followed by a "champing" sound. This passion he exhibited, becoming quite furious when shown a stuffed bird of any size—a huge Pelican, which was his pet aversion, being usually subjected to the fiercest onslaughts when shown to him at the bars of his aviary; these were followed by a continued uttering of his note of anger until his passion died away. At about the age of twelve months he commenced to utter his adult note; but now and then, more particularly in the breeding-season, during the first three years, I heard the querulous cry peculiar to the young stage. When shown any object which excited his interest or curiosity, such as a tempting morsel of food, without the bars of his aviary, he had a singular habit of twisting his head round till it was completely turned upside down, all the time keeping his eyes fixed on the subject of his examination. At other times, when under the influence of excitement from any cause, he would throw his head back until it touched his back, and sway his head too and fro with a spasmodic outdarting of his wings, as if he were going to launch himself through the roof of his aviary. He made two voyages round the island with me, and one trip across country in a bullock-bandy, and during his life in Ceylon experienced several adventures, one of which well-nigh proved fatal. While at Trincomalie he narrowly escaped being killed by a wild cat, from whose clutches he must have escaped purely by dint of fierce struggles, and inflicting, no doubt, severe wounds on the animal with his talons. One morning, during my absence in the jungle, he was found to be missing, and on examining the aviary a large hole was discovered in the roof, through which he had evidently been dragged; search was made high and low throughout the whole premises, but not a sign of the eagle was anywhere to be seen. About midday, when the house-coolie went to draw water, the unfortunate bird was perceived floating on the surface, which was about 30 feet below the trap. On rescuing him from his perilous position he was found to be uninjured, with the exception of a wound at the point of the wing, evidently made by the teeth of a cat, which must have dragged him across the compound some 40 yards, with a view of taking him through an opening at the back of the wall, where the beast found the eagle's clutches too strong for him, and dropped him close to the trap, down which he had fallen in the darkness. Neither his mauling by the cat nor his five or six hours' cold bath in the darkness of the well had done much towards intimidating his eagleship; for the plucky little fellow fought vigorously while being secured, and it was only by dint of enveloping him in the coolie's cloth that he could be brought up again to *terra firma*. He was then tied to a stick and well dried in the sun, and then, much to my wife's satisfaction, was reinstated, undaunted by his adventures, in his aviary.

Nidification.—The Crested Eagle breeds in the south of Ceylon in February and March, but commences in the north somewhat earlier. In the neighbourhood of Trincomalie I twice found its nest during the course of its being built or repaired in January, but was unsuccessful in obtaining the eggs, for the birds deserted on both occasions. They were both large structures of sticks placed in the uppermost branches of banyan trees, and appear to have taken a long time to set in order, one nest being worked at for a month before I ventured to have it looked at, and then it seemed to have made but little advance. Only one young bird appears to be reared, for I am aware of two instances in which a solitary eaglet was taken from the nest.

The front figure in the Plate accompanying this article represents the dark bird now in the Zoological Gardens, and in his sixth year. The second is that of an immature *light* bird, which I shot with three others on the same day in the Batticaloa district.

ACCIPITRES.

FALCONIDÆ.

AQUILINÆ.

Genus SPILORNIS.

Bill longer than in the last genus; festoon slightly pronounced, the culmen curved from the cere; the cere advanced. Nostrils oval, oblique, protected by the loral plumes. Eyelid furnished with long lashes. Wings short, rounded, the 4th and 5th quills the longest. Tail moderately long and ample. Tarsus slender, feathered slightly below the knee, protected with small hexagonal scales both in front and behind. Toes short, furnished at the tip with transverse scales, changing at their bases into the reticulated scales of the tarsus; claws short and rather straight.

Head furnished with a heavy rounded crest, extending entirely across the occiput.

SPILORNIS SPILOGASTER.

(THE CEYLONESE SERPENT-EAGLE.)

Buteo bacha, Vigors, Mem. Raffl. p. 650 (1830, *nec* Daud.).

Hæmatornis spilogaster, Blyth, Journ. As. Soc. Beng. vol. xvi. 1852, p. 351; Kelaart, Prodromus, Cat. p. 114 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 100.

Hæmatornis cheela, Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 99.

Spilornis bacha, Holdsworth, Proc. Zool. Soc. 1872, p. 412; Legge, Ibis, 1875, p. 277.

Spilornis spilogaster, Walden, Ibis, 1873, p. 298; Gurney, Ibis, 1878, p. 100.

Spilornis cheela, Legge, Ibis, 1874, p. 9.

Spilornis melanotis, Sharpe, Cat. Birds, i. p. 289 (1874).

The Harrier-Eagle, *Buzzard-Eagle*, in India (pt.); *The Cheela Eagle*, *Ceylon Eagle*, "*Cheela*," Kelaart and Layard; *Serpent-Eagle*, Europeans in Ceylon.

Rajaliya, Sinhalese; *Cudoombien*, Tam., in Ceylon (*apud* Layard).

♂ *ad.* similis *S. bachæ*, sed ubique pallidior, gutture pallidè cinerascente nec nigricanti-brunneo: pectoris et abdominis maculis ocellatis minoribus, minùs rotundatis et saturatiore brunneo circumdatis: pedibus obscurè flavicantibus: iride flavâ.

Adult female. Length to front of cere 22·0 to 23·5 inches; culmen from cere 1·3 to 1·4; wing 15·3 to 15·8; tail 9·0 to 10·5; tarsus 3·3 to 3·4; middle toe 1·8, its claw (straight) 0·9; height of bill at cere 0·65.

Male. Length to front of cere 21·5 to 22·5 inches; wing 14·5 to 15·7 (average of seven examples 15·1); tarsus 3·2 to 3·3.

Obs. The above measurements are taken from a series of examples shot in the low country or on its hill-borders, representing a small type of our Serpent-Eagle inhabiting these districts. The majority of examples from the Kandyan province are considerably larger, and may be fairly held to constitute a bigger race of the species, as will be seen from the following dimensions, taken from several specimens:—

Adult female. Length to front of cere 25·0 inches; culmen 1·5; wing 15·9 to 16·6; expanse 52·5; tail 11·0 to 11·5; tarsus 3·4 to 3·5; middle toe 1·8.

Male. Wing 1·5 to 15·8 inches.

Iris golden yellow, the external edge, in some, indented with black; cere and loral skin varying from greenish yellow

to "citron;" gape greenish yellow; bill bluish at cere and base, darkening at the tip to blackish; legs and feet citron-yellow (usually much stained).

Fully adult plumage. Forehead, crown, and elongated occipital feathers more or less overlying the entire hind neck jet-black, with the basal two thirds of the feathers white and concealed beneath the black portions, and the tips almost always faintly tipped with fulvous; cheeks and ear-coverts more or less blackish grey, according as the throat is light or dark, blending into the adjacent black; hind neck, back, rump, scapulars, wing-coverts, and tertials dark neutral brown, with a strong purplish lustre, particularly on the upper back and scapulars; lower part of hind neck paler than the back; upper tail-coverts tipped with white; least wing-coverts, including the winglet, with two terminal white spots on each feather; greater wing-coverts tipped white at the outer feathers; terminal portion of the primaries and secondaries (about $2\frac{1}{2}$ inches of the former), a narrow band across the centre of the feathers, and another near the base blackish brown, with a purple lustre, the interspaces smoky brown on the outer webs, gradually paling to white internally, the whole band showing whitish beneath; secondaries and shorter primaries tipped with white; winglet blackish brown, tipped with white, and barred near the base of the inner webs with the same; tail with a two-inch terminal band, and a second, nearly as broad, on the basal half purplish black; an equally broad interspace of dusky whitish, more or less clouded with light brown, and the space between the second band and the coverts paler, but not conspicuously lighter than the band; all the caudal feathers tipped with white.

Loral and rictal plumes black; chin and gorge iron-grey, more or less dark according to the individual, in some almost as pale as the fore neck, which, together with the chest and under surface, varies from a light earth-brown to a chocolate-colour, paling always slightly towards the belly and under tail-coverts; the feathers of the breast, flanks, belly, and thighs with a series of roundish, opposite white spots surrounded by a dark edge; on the under tail-coverts, and in some specimens on the thighs, the spots develop into bars, either continuous or interrupted at the shaft; under wing-coverts, as in the young stages, variable, the ground-colour of the lesser series usually more rufous than that of the breast and covered with large white spots, which, near the tip, predominate over the brown; greater series dark brown, spotted like the rest; edge of the wing unspotted white.

Mature plumage. In this phase the lower feathers of the crest are tipped with fulvous, and in some the basal portion washed with the same; the cheeks, ear-coverts, and chin are darker than in old birds; the scapulars, median wing-coverts, and rump-feathers are tipped with white; winglet more conspicuously tipped than in the above; markings of quills and caudal feathers much the same; sometimes the secondaries are terminated with brown, adjacent to the white tip, and occasionally there is a remnant of *white mottling* above the central tail-bar.

Under surface chocolate-brown, the fore neck darker, blending into the blackish-grey hue of the throat, and the feathers slightly edged with fulvous; lower parts darker than in the fully adult, the edging round the spots deeper, and these latter, therefore, more conspicuous; under wing-coverts dark like the breast, the spots on the lesser series smaller than in old birds; external edge of wing-lining sometimes unmarked white, at others striped or barred, like the rest of the feathers, with brown; under surface of tip of tail showing more white than the upper.

Obs. Great variation exists, particularly in this latter stage, in the markings of the under surface, although there is, as in the coloration of the throat, a certain similarity of type, which distinguishes the species from some of the more eastern forms. As regards the spots, in birds of the same age and with similar upper-surface plumage, they are in some examples very large and darkly bordered, in others small, and then, of course, more of them on each feather, the edge being sometimes scarcely darker than the ground of the feathers; in others, again, they are more bar-shaped than circular. There is, in this mature stage, sometimes an indication of fulvous cross-marking near the tips of the chest-feathers; but I have never seen it in a fully old, completely black-crested bird. In some specimens much more of the hind neck is blacker than in others, the sides of this part being black right round to the throat. Hill examples of the larger race are blacker on the chin and throat than the small birds of a like age. This is a peculiarity I have observed in 4 specimens at Norwich, 4 in Mr. Bligh's collection, and 2 in my own.

Young (bird of the year). Iris greenish yellow, sometimes with a brown inner circle, in one specimen I have seen (as also in that referred to by Mr. Blyth, *l. c.*, as drawn by a Mr. Moogaart) white; cere, gape, and loral skin greenish yellow; bill dark horn-colour, the tip blackish; legs and feet pale yellow.

The white eye appears to be an abnormal, though doubtless not an unfrequent feature.

Head and elongated occipital feathers dusky fulvous, the feathers with an extensive subterminal blackish-brown patch and deep tips of buffy white, the bases white; interscapular region, wing-coverts, and scapulars rich sepia-brown, with a purplish lustre, becoming paler on the rump and upper tail-coverts, the feathers tipped with fulvous grey, least so on the lesser wing-coverts, which are darker than the median series; these and the greater coverts tipped

generally with white and spotted on both webs with the same, the markings in some taking the form of bars; primaries and secondaries dark earth-brown (this colour corresponding to the light interspaces in the adult), terminal portions blackish, and the rest of the feather crossed with three bars of the same; the brown interspaces mottled with white at the inner edge, and the tips of all the quills deeply marked with the same; upper tail-coverts tipped with white; tail light brown, mottled transversely with white, with a subterminal band, one about the middle, and one at the base, of purplish black; lateral feathers with three bars and the tips of all white, the inner webs white at the edge.

Cheeks, ear-coverts, chin, and upper throat black, the feathers white at the base, and those at the lower edge of the gorge tipped with fulvous; in some birds the throat is marked up to the chin with this hue; fore neck, chest, and under surface chocolate-brown, light in some, dark in others, the breast marked inconspicuously with fulvous-brown cross rays; the lower parts, thighs, and under tail-coverts spotted with white as in the adult, the spots with less dark surroundings, those on the under tail-coverts developing into bars; under wing-coverts and axillary plumes concolorous with the chest, except the greater series, which are blackish brown, the whole with large round spots of white, but covering the ground-colour less than in the adult; external edge of wing-lining white; base of quills beneath white.

The change from this plumage, which is that of Blyth's *S. spilogaster*, to the mature dress following the adult plumage in this article takes place in the gradual increase of the black on the head-feathers, the decrease of the pale terminal margins of the upper surface, the widening of the subterminal black caudal band and its adjacent light interspace, causing a moving up of the centre dark band, and in the gradual lessening of the light interspace above it; the light transverse rays across the chest (in those birds which possess them) grow fainter, and the ocelli of the lower parts extend, as a rule, more up the breast. These changes take place in the second moult.

Hill birds in their first plumage often have the white wing-covert tippings, in the form of deep terminal margins, extending up the webs, on which the bar-like markings are more extensive than in low-country birds. In one specimen the basal portions of the mantle-feathers are fulvescent buff, showing on the surface very markedly; the head-feathers do not show much of the fulvous centres, and the throat is a very dark brown, blending into the chocolate of the fore neck.

*Light phase of young plumage**. A pale or albescent form of plumage exists occasionally in the young of this species, which is analogous to the same feature in the Booted Eagle (see remarks in my article on this latter bird).

Such an example, in my collection, shot near Kadugannawa in October 1876, has the upper surface similar to other birds, except that the least wing-coverts are very lightly tipped with fulvous, whereas the greater and median coverts have much white about them, the inner webs of the latter being almost entirely of this colour and the outer margined with it; cheeks, ear-coverts, and chin black; throat, chest, and entire under surface buff-white; the feathers of the chest, sides of the breast, and flanks with large oval patches of deep brown on their terminal portions, which diminish on the lower parts into oval central streaks; the long flank-feathers covering the thighs barred widely with a paler brown, with which the thighs are closely banded; coverts immediately beneath the ulna spotted with brown; remainder of the wing-lining white, a few of the feathers with a single dark spot near the tip; base of primaries white beneath.

Obs. This Serpent- or Harrier Eagle, as the genus is perhaps more generally styled in India, was referred to by Layard in his notes as *Hæmatornis cheela*, it having been identified for him as such by Blyth in the days when it was not discriminated as distinct from this latter northern form. Adult specimens are still extant in the faded collection at Poole. Subsequent (evidently) to his acquaintance with the bird in its adult character, immature specimens were procured by Dr. Kelaart and himself, and sent by both gentlemen, under the impression that they belonged to a new species, to Blyth, by whom they were described as such under the title of *H. spilogaster*, by which name it must now stand as a Ceylonese and Sumatran bird.

From the Northern-Indian *Spilornis cheela* it differs widely, inasmuch as it is a much smaller bird, has a paler throat, wants the yellowish-brown cross markings on the chest which are characteristic of the mature birds in that species, and differs in the character of the ocelli of the lower parts.

As regards the South-Indian form, whether the *Sp. melanotis* of Jerdon, or perhaps, more properly speaking, *Sp. albidus* of Temm., represents the common species of that part, I am unable to say; but if it does, the Ceylon bird is its inferior in size. The wing in Jerdon's type, from the foot of the Nilghiris, is 16 inches; but it is probably a male, as other examples in the British Museum, referred by Mr. Sharpe to that species, exceed 17 inches in the

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* This occurs in *S. cheela*; there is a similar specimen in the British Museum.

wing, and I have lately examined a bird, not fully adult, from Malabar, which has a wing of 18·2. It may be well to remark that this specimen, which has since passed into the Norwich Museum, and was noticed by Mr. Gurney ('Ibis,' 1878, p. 145), does not differ much from immature examples of *S. cheela*, the breast and under surface being isabelline brown, and the white ocelli surrounded each by a bold dark margin, in addition to which the axillaries and under wing-coverts are differently coloured. The nearest affinities of *S. spilogaster* are with the Malayan races, to which it approaches closely in size. It is, however, distinguishable from *S. davisoni* from the Andamans, which species has the ocelli small, very round, and more confined to the lower parts.

From the Javan Serpent-Eagle, also (the *S. bacha* of Mr. Sharpe's Catalogue, and to which it has of late been referred), it differs in a marked manner, inasmuch as the latter species is very dark above and beneath, and possesses in its adult stage an almost black throat, the contrast of *S. spilogaster* at that period ; the under wing is likewise different, the lesser coverts being concolorous with the greater, and not paler as in the Ceylonese form.

To the Sumatran bird, however, it approaches very closely, so much so that Mr. Gurney thinks ('Ibis,' 1878, p. 100) the two races are identical. I have carefully examined the series from Sumatra in the Norwich Museum, in company with that gentleman, and though slight points of difference exist, they do not appear sufficient to rank as specific, in which case the species should bear the same name as the Ceylonese, as it is not identical with *Sp. bacha* of Java, with which it has been hitherto united. The differences referred to are the darker throat of the adult, and the lighter, less clouded pale tail-band, resembling somewhat that of *S. pallidus* from Borneo. The four examples which constitute the series seem as a whole to be smaller than Ceylonese, although the wing in one attains 16·5. The race from Singapore is also not separable from the Sumatran ; but in its young stage it differs from Ceylonese immature birds (there are none forthcoming from Sumatra) in the subterminal pale band being considerably broader. It is therefore possible that when a larger series is got together from Sumatra, containing old and young, the race may be found, as in the case of the Singapore bird, to differ from the subject of this article in its young plumage.

I subjoin a synopsis of the several species of *Spilornis* referred to in the above observations, in order that the respective characteristics may be seen at a glance :—

a. *Spilornis cheela*. *Hab.* Himalayan region, Burmah, China, Formosa.
Large size : wing 18·0 to 19·5 inches.
Ad. Chest almost always crossed with narrow transverse striæ ; throat and cheeks iron-grey ; ocelli of the lower parts bar-shaped, with a brown border.
Juv. Head black as in adult, but the dark hue separated from the white base of the feather by a fulvous patch ; throat and cheeks black.

b. *Spilornis melanotis*. *Hab.* Peninsular India.
Smaller : wing 16·5 to 17·8 inches.
Very similar to *S. cheela* in plumage.

c. *Spilornis spilogaster*. *Hab.* Ceylon, Sumatra, and Straits Settlements ?
Smaller still : wing 15·3 to 16·6 inches.
Ad. Chest uniform brown, without any transverse striæ ; throat and cheeks pale iron-grey : under-surface spots variable in shape and size, surrounded by a dark edge, which is also variable in intensity ; median under wing-coverts concolorous with the chest.
Juv. Head-feathers conspicuously tipped with white ; throat and cheeks blackish.

d. *Spilornis bacha*. *Hab.* Java.
Similar to *S. spilogaster* in size.
Ad. Very dark above and beneath ; throat and cheeks black-brown ; ocelli large, rounded, the edge scarcely darker than the ground-colour of the feather.

e. *Spilornis davisoni*. *Hab.* Andaman Islands.
Smaller than *S. spilogaster* : wing 15·0 inches (Hume).
Ad. Ocelli small, very round, and not extending much above the abdomen.

Distribution.—The Serpent-Eagle is widely distributed over the whole island, but is much more numerous in the dry forest-clad tracts of country than in the humid and more cultivated portions. It is a common bird

in the continuous jungles of the south-eastern low country, parts of the "Park," the Eastern Province, and the entire northern half of the island. In all these districts it is chiefly to be found in the vicinity of village tanks or on the banks of the forest-lined rivers.

In the Western Province it is a scarcer bird, and is mostly confined to the wild country commencing near Avisawella and stretching through Saffragam, and thence along both banks of the Kaluganga to the maritime districts at its mouth. In the hilly country between Galle and the Morowak Korale it is likewise an uncommon bird, being now and then met with on the outskirts of damp paddy-land and on the banks of the Gindurah and other streams. As regards the Kandyan province, it is found generally throughout the coffee-districts, extending even to the Nuwara-Elliya plateau; but it is chiefly noticeable about Kadugunawa, in parts of Dumbara and the Knuckles district, in Dolosbage, and thence into Ambegamoa. In Haputale it is not uncommon, Mr. Bligh having procured many specimens in that district. It is found as near Colombo as Atturugeria and Kaduwella; but going northwards of the capital it is not very frequently met with until the Maha Oya is passed and the drier districts near Kurunegala reached.

Layard, who thought it to be migratory, remarks of its distribution, under the head of *Hæmatornis cheela*, "Abundantly and widely distributed throughout the island;" and in speaking of the immature phase (*H. spilogaster*) says, "the Doctor" (Kelaart) "procured his specimen at Trincomalie, whilst I killed mine in the Vanni. I afterwards shot another pair at Pt. Pedro." From his observations it appears that the species visits the north (the Jaffna peninsula is probably meant) in March, and remains until July. It is very probable that a partial movement to the peninsula does take place at that season, which led to the belief that the species was migratory.

Beyond the confines of Ceylon, this species reappears in the island of Sumatra and extends thence to the Straits Settlements. It was first made known from Sumatra by Sir S. Raffles.

Habits.—This small Eagle, whose serpent-destroying propensities make it a useful bird, is a denizen of forest, frequenting the banks of streams and rivers and the borders of tanks, more especially the smaller class known as the village "Kulam." Every such sheet of water possesses its pair of Snake-Eagles, which haunt the heavy jungle and huge trees clothing the bunds or dams, and patiently watch throughout the day from some huge outstretching limb for the various snakes and frogs which disport themselves from time to time on the banks of the stagnant pool. On espying its prey, the yellow-eyed bird raises his massive topknot, and with glistening orbs darts noiselessly down with dangling feet, and sweeping off the luckless reptile, mounts to the nearest perch and there devours it, resuming there and then his patient watch. This sluggish existence is, however, varied by a daily soar above his accustomed haunt, in the blaze of the noonday sun, when he mounts to a great height in wide circles, and with loud screams proclaims his freedom and success.

Equally at home by the sandy beds of the dried-up rivers in the northern and eastern forests, one of these Eagles may be encountered, at every mile or so, during a ramble down these romantic watercourses. They are invariably seated on the overhanging limb of an immense Kumbook tree, and when disturbed skim noiselessly on before the intruder and take up their post again on the nearest inviting perch.

The last specimen of this Eagle procured by me in Ceylon fell to my gun at one of these riverine haunts under rather interesting circumstances. It was about 4 o'clock on the evening of a scorching day in the Seven Korales when I arrived at the banks of the dry course of the Kimbulana-Oya; and leaving my jaded bullocks to enjoy the welcome shade of the grand umbrageous trees overhanging the crossing-place, I started for a tramp down the heavy sandy bed of the river. Here, as in most rivers in the north and east, which in the wet season are mighty torrents, not a drop of water was now to be seen, save in some more than ordinary deep holes under the denuded roots of the great trees which grow on the bank or in the hollows of the large rock-masses which stood up here and there from the sandy bed. Above most of these tiny pools sat a solitary Little Blue Kingfisher, eagerly eyeing the water, round the edge of which ran quietly one or two Green Sandpipers or a Common Snipe, reduced by scarcity of food to a rare degree of tameness. On rounding one of the rocky barriers a huge Owl glided noiselessly from the branches of an overhanging tree, and immediately fell to my first barrel with a broken wing. As the wounded bird waddled off a Serpent-Eagle, evidently taken aback at the sight of his companion trailing his wing along the sand, swooped down on him, doubtless out of mere curiosity, and quickly followed him to ground with a fractured pinion. This brought the Owl to a sudden

halt; and the two birds now presented a most singular spectacle, standing almost side by side and glaring with manifest amazement first at me and then at each other—the Owl with his long aigrettes erected and his immense yellow orbs staring from beneath them as he angrily snapped his bill; while the Eagle stood in his most defiant attitude, his amber eyes glaring fiercely, and his bushy topknot rising and falling as I approached him! It was a fit tableau for an artist; but, alas! was soon spoiled; and ere many minutes the interesting birds were dangling dead from the roof of my bullock-cart.

The Harrier Eagle may often be met with by the sides of tracks in the northern and eastern jungles, and is usually found with a snake dangling in its talons, which has been killed at the open side of the rudely-made road. When wounded, it is a very handsome object, placing itself on the defensive with its glaring yellow eyes and huge uplifted topknot.

Serpents are killed by these birds before being carried off, a bite on the neck soon depriving them of life; they may often be seen dangling from their grasp in the air, or hanging dead from their talons when perched. The food I have always found on dissection to be torn in pieces; but it is sometimes devoured whole—Mr. Holdsworth recording an instance of a Tree-Snake (*Passerita*), which is the favourite quarry with the Serpent-Eagle, being disgorged whole from the stomach of a wounded bird. Lizards and frogs are likewise eaten, but not so commonly as snakes. The note of this species is a prolonged and clear scream of three syllables, with the accent on the first, and is not unlike that of the Kite-Eagle.

Layard refers to the "doleful moanings" of this bird "scaring the herd-boy from the tank side, or the lonely native threading his way through the jungle." I myself have never heard these sounds, although the species was constantly under my observation for two years in the jungles of the north, haunting sometimes the vicinity of my camp from morning to night; I infer, therefore, that they may be the utterances peculiar to the breeding-time, which I was not fortunate enough to hear.

With his accustomed keen powers of observation he marked the habits of the Harrier-Eagle well, and has the following descriptive paragraph of them in the 'Annals and Magazine of Natural History':—"Concealed in the dark foliage of some overhanging tree, it heedlessly marks the smaller frogs approach the grassy margin of the pool. Suddenly the large green Bull-Frog (*Rana malabarica*) uplifts its head and utters its booming call. The *Cheela* is now all attention; with outstretched neck it fixes its glaring eyeballs on its desired prey; lower and lower it bends, for the frog, which has now reached the sedges with a croak of triumph, gains a log. But a shadow glides over him—in vain he crouches—and his colour becomes a dull brown, so closely resembling the log, that human eyes would take him for a knot in the decaying timber; with noiseless rapidity the barred wings pass on, and the log is untenanted. Fast clutched in the talons of his merciless foe, the frog is borne to the well-known perch, and a sharp blow on the back of the neck from the bill of the bird deprives it of life."

In the dry season I have known it to take up its quarters permanently by the side of a small water-hole a few square yards in extent, so that it might live on the frogs and snakes which frequented the muddy little spot.

Nidification.—The nest of this Eagle has very seldom been found; and the eggs I have never been able to procure. It breeds in the Western Province in March and April, Mr. MacVicar, of the Ceylon Public Works Department, having received a young bird taken from a nest in the Hewagam Korale in the latter month. The nest was described to me as being a large structure of sticks placed in the fork of a tree.

Layard, who was very fortunate in finding the nests of rare birds, remarks that "it builds in the recesses of the forest on lofty trees. The structure is a mass of sticks piled together and added to year by year. The eggs, generally two in number, are 3 inches in length by 2 in diameter, of a dirty chalk-white, minutely freckled at the obtuse end with black dots."

ACCIPITRES.

FALCONIDÆ.

AQUILINÆ.

Genus HALIAETUS.

Bill very stout and long, the cere and base of culmen straight, tip suddenly hooked; festoon well developed. Nostrils round and directed straight backwards and quite exposed. Eyelid devoid of lashes. Wings long, the 3rd quill the longest, the 1st slightly exceeding the 7th; the outer webs of the longer primaries abruptly notched. Tail short, scarcely exceeding the closed wings, cuneate at the tip. Tarsus very stout and longer than the middle toe; its upper third feathered in front, the remainder covered with broad transverse scutæ, the hinder part shielded with narrower transverse scales. Toes protected by rectangular scales to the base; outer toe only slightly longer than the inner; claws short, rather small and well curved, trenchant beneath.

HALIAETUS LEUCOGASTER.

(THE WHITE-BELLIED SEA-EAGLE.)

Falco leucogaster, Gm. S. N. i. p. 257 (1788, *ex* Lath.); Temm. Pl. Col. i. pl. 49 (1823).
Falco blagrus, Daud. Traité, ii. p. 70 (1800).
Haliaetus blagrus, Cuv. Règne An. i. p. 316 (1817).
Falco dimidiatus, Raffles, Trans. Linn. Soc. xiii. p. 277 (1822).
Haliaetus leucogaster, Vig. Zool. Journ. i. p. 336 (1824); Gould, B. Aust. pt. 3, pl. 37. fig. 1 (1838); Schlegel, Mus. P.-B. *Aquilæ*, p. 14, 1862; Jerd. B. of Ind. i. p. 85 (1862); Schlegel, Vog. Nederl. Ind., Valkv. pp. 9, 50, pl. 4. figs. 1, 2 (1866); Hume, Rough Notes, i. p. 259 (1869); Holdsworth, P. Z. S. 1872, p. 412; Ball, Journ. Asiat. Soc. Beng. 1872, p. 276; Sharpe, Cat. Birds, i. p. 307 (1874).
Ichthyaetus leucogaster, Gould, B. Austr. i. pl. 3 (1837); Gray, Cat. Accipitr. 1844, p. 13.
Pontoaetus leucogaster, Gray, Gen. Birds, i. p. 18 (1845); Kelaart, Prodromus, Cat. p. 114 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 100.
Cuncuma leucogaster, Gray, Cat. Accip. 1848, p. 24; Wall. Ibis, 1868, p. 15; Walden, Trans. Zool. Soc. viii. p. 35 (1872); Hume, Str. Feath. 1874, p. 149; id. Nest and Eggs, i. p. 48; Legge, Ibis, 1875, p. 278; Hume, Str. Feath. 1876, p. 461.
Blagrus leucogaster, Blyth, Cat. B. Mus. A. S. B. p. 30 (1849); Swinh. Ibis, 1870, p. 86.
Polioaetus leucogaster, Gould, Handb. B. of Austr. i. p. 13.
White-bellied Eagle, Lath. Gen. Syn. i. p. 33 (1781).
Le Blagre, Levaill. Ois. d'Afr. i. pl. 5 (1797).
The Grey-backed Sea-Eagle of some writers; *The* "*Fish-Eagle*," "*Fish-Hawk*," Europeans in Australia; *The* "*Sea-Eagle*," "*Osprey*," Europeans in Ceylon. *Duck-Eagle*, Andamans.
Kohassa, Hind.; *Samp-mar*, Hind. in Orissa; *Ala*, Tel. and Tam. (*apud* Jerdon, *l. c.*); *Lang-laut*, Sumatra.
Loko-Rajaliya, Sinhalese; *Kadal-ala*, Tam. in Ceylon.

Adult male. Length to front of cere 25·2 to 26·5 inches; culmen from cere 1·98 to 2·0; wing 21·2 to 22·5, expanse 71·5 to 78·0; tail 10·0; tarsus 3·4 to 3·8; mid toe 2·3 to 2·4, claw (straight) 1·05 to 1·1; hind toe 1·5, claw (straight) 1·4; height of bill at cere 0·71.

Female. Length to front of cere 27·0 to 27·75 inches; culmen from cere 2·1; wing 22·5 to 24·0, expanse 79·0 to 80·1; tarsus 4·0; mid toe 2·5, claw (straight) 1·2.

A series of Malaccan, Indian, and Cape* birds examined in the British Museum correspond well in size with Ceylonese; and Tasmanian examples, which are very fine, do not, as far as I am aware, exceed the above limits.

Iris hazel-brown; cere pale leaden; bill dark leaden; legs and feet whitish, or sometimes pale greenish white.

Entire head and neck, with the entire under surface, lesser under wing-coverts, under tail-coverts, and terminal 3½ inches of the tail pure white; interscapular region, back, and rump dark cinereous grey, becoming darker on the upper tail-coverts; the white feathers at the lower part of the hind neck with dark shafts, and the grey hue appearing lower down on each side of them; wing-coverts, scapulars, and tertials bluish slate-colour, with dark shafts; quills and basal portion of the tail blackish cinereous; under wing-coverts and flank-feathers with black shafts.

I observe no variation in the tints or proportions of the several colours in this bird from all parts of its habitat.

Young. The unfledged nestling† has the iris brown; bill and cere very much as in the adult but more "fleshy," and the base of the under mandible very pale; legs and feet fleshy white. The body is covered with pure white down for about three weeks, when yellowish-brown feathers appear on the nape, and dark brown ones on the scapulars, the primaries coming out blackish at the same time, the whole being tipped with white, which shows most conspicuously on the forehead and crown; the tail-feathers, which are brown, tipped with fulvous, appear simultaneously with the primaries; the chest is clothed with umber-brown feathers, with fine tips of fulvous. The various hues of this first plumage alter somewhat during the first six months until they settle down into the normal hue of the yearling dress.

At a year old the iris is of the same hue as the adult's, the bill has lost its fleshy tint, and the legs are as in old birds. The plumage is as follows:—

Head, neck, and throat pale tawny brown, lightest on the chin, and the tips and margins of the head-feathers paler than the rest; over the eye there is a pale stripe, and above the ears a conspicuous dark patch; the light hue of the hind neck darkens into rich brown on the interscapular region, back, and wings; the lower part of hind neck and the lesser wing-coverts tipped with fulvous; the edge of the wing above the flexure has the feathers broadly margined with buff-white, which with a light patch on the side of the neck, partly concealed by the wing, forms a conspicuous light space in the bird's plumage; the median wing-coverts and the inner feathers of the greater series edged fulvous; the winglet and the quills are deep brown; the upper tail-coverts blackish brown, edged whitish; tail white at the base, with the terminal half blackish, blending with a mottled edge into the white; chest and upper breast chocolate-brown, the lower part edged with fulvous; the breast below this and the belly are whitish, washed at the sides with pale brownish; under tail-coverts whitish; on the under wing the secondary coverts are buff, marked with brownish, the greater row of the primary-coverts brownish, the next fulvous, and the least series brown, edged with buff. At the end of the first year the head, in the example here treated of, got very much paler, and the dark half of the tail faded considerably, while the chest-patch became much lighter.

After the first moult an advance towards the adult dress is made on the head, tail, and under surface; but the back and wings remain in the brown plumage still. The head and hind neck have the bases of the feathers brownish, and the terminal portions fulvous-white, revealing in the centre the dark shaft; the interscapular region and lesser wing-coverts are of a corresponding deep brown, with narrow pale margins; the median wing-coverts have the external portions of the feathers brownish fulvous, and the central brown with darker shafts; the upper tail-coverts are more or less white, mottled and clouded with blackish brown near the tip; the order of coloration in the tail is reversed, the terminal half becoming white and the basal black, but not completely so, some of the inner webs being nearly all white.

The throat and cheeks are fulvous-white, with a dark patch above the ears; the pale fore neck darkens into light earth-brown on the chest, the centres of the feathers being whitish with dark shafts; this part gradually pales, with a mottling of brown, into the whitish of the lower parts, on which, however, the shafts are brown; the lesser under wing-coverts are a rufescent buff, the upper series shaded with brown, and the greater row of the primary-coverts blackish brown.

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* Specimen "*m*," p. 308, Sharpe, Cat. of Birds.

† The immature plumages of this Eagle are described from birds reared from the nest in my aviary.

In the third year traces of immature plumage sometimes remain in the form of patches on the chest and some brown feathers in the wing-coverts; but I imagine that, as a rule, the adult dress is then put on.

There was a singular example of this Eagle, exhibiting a phase of plumage bordering on melanism, in the Zoological Gardens last year, and which it may be interesting to notice here. The head and neck were uniform earth-brown, and the back and wings dark brown; the cheeks and throat were pale brownish, and the whole under surface sooty brown; under surface of quills pale greyish, and the lesser under wing-coverts tawny.

Distribution.—The Grey-backed Sea-Eagle is a common bird round the whole of the north and east coasts and down the west side of the island to the lower end of the Puttalam lake. On the Jaffna lake and among the numerous islands off the west coast of the peninsula, as well as on the many back waters and estuaries from Point Pedro to Battiealoa, it is a characteristic ornithological feature of the coast; and further south every river-month that debouches on, and every salt lagoon that lines the shore from Kalmunai to Tangalla has its pair of Eagles. On the west coast, from Chilaw to Point de Galle, where the line of coast is less cut up by brackish inlets, it is not so frequent, being there confined to particular localities, such as the Negombo, Panadure, and Amblangoda lakes and the estuaries of Kalatura and Bentota. In the harbour of Galle a pair are often to be seen, and have their head-quarters at the Kogalla Lake or other neighbouring sheet of water, where an abundant supply of fish furnishes them with daily food. It is not, however, confined to the sea-coast; for the large tanks of the Eastern Province, viz. Ambaré, Erakkamum, and others, are frequented by it; and in the northern half of the island it is a permanent resident on all the large inland sheets of water, such as Minery, Kanthelai, and Tissa Wewa tanks. Its presence at the two former of these lakes adds no little to their romantic beauty; there are always one or two pairs there, which breed in the adjacent forest, and probably never leave the vicinity of these fine sheets of water. At Minery there is an eyrie on the great bund of the tank, and at Kanthelai a huge nest existed, until it was cut down, for many years in the fork of a lofty dead tree which towered above the surrounding forest on the north side of the lake.

The Grey-backed Sea-Eagle has a wide geographical range, extending north to south from Northern India to Tasmania, and west to east from the Cape of Good Hope to the Friendly Islands. In India it is chiefly confined to the sea-coast, and on the western side does not extend commonly above Bombay. It is very numerous near Pigeon Island (lat. 14° N.), which forms one of its chief breeding strongholds. At the Laccadive group it is rare, Mr. Hume recording but one specimen, which he saw at the island of Amini. In the other islands of the Indian Ocean, to the south-west, viz. the Seychelles, Mauritius, &c., it disappears, but again appears at the Cape of Good Hope, provided, that is, that M. Verreaux's specimen in the British Museum is correctly labelled. Returning to India we find it more common on the east coast than it is on the west, and at some parts of it it extends far inland, for Mr. Ball records it as by no means rare in Chota Nagpur. In Burmah it is likewise common; Mr. Davison procured it in Tenasserim, and Mr. Armstrong along the coast of the Irrawaddy delta, but found that it did not extend far up the Rangoon river. In the Gulf of Siam, Finlayson says that it frequents the desert islands. In the Malay peninsula and in all the islands of the Bay of Bengal it is numerous, and it inhabits the entire chain of the Malay islands from Sumatra to Timor, and extends thence through Borneo, Celebes, and the Moluccas to the Philippines, in which group it has been found as far north as Luzon. Eastward and to the south of the Philippines it has been found in the Solomon Islands and in New Guinea. Down the entire east coast of Australia to the islands of Bass's Straits and Tasmania it is a common bird, and, according to Gould, extends up the west coast of the insular continent to Swan River; but I have no doubt that it inhabits the entire western seaboard round to Torres Straits. It has not been observed in New Zealand, which, in spite of the peculiar character of the ornis of this country, is somewhat singular in a bird of such wide range.

Habits.—The island of Ceylon being devoid of the larger and more regal members of the genus *Aquila*, the present species must be considered to rank foremost among its Eagles. Though not possessing the courageous nature or the bold aspect of the powerful Mountain Hawk-Eagle, the lofty, noble flight and commanding bearing of this fine bird, together with the associations of foaming shores and flowing tides, amidst which it passes its life, impart to it an interest for the naturalist and sportsman which does not attach to its congeners of the hills and forests. It frequents the open coasts of North and East Ceylon, as well as the estuaries, lagoons, land-locked bays, and salt lakes which form the chief geographical feature of the seaboard. It lives in pairs,

and confines itself to one particular spot—a sequestered hill-side, containing its one or two huge banyan trees towering above the surrounding jungle, or the forest-covered bank of some inland sheet of water; here it breeds and passes all its life, sending forth its young to other haunts, which are usually not far from the place of their birth. Sallying out in the early morning, it quietly sails along high above the resounding shore, its wings outstretched and motionless, and its snowy head turning from side to side, as it scans each passing reef for its favourite morsel, the sea-snake; or it sweeps out to sea, with its eye intent on the inhabitants of the blue waters beneath; and keen indeed is its sight. Should any luckless fish venture to the surface beneath those silent wings, his time has come; with half-closed pinions and extended talons the Fish-Eagle descends with a booming rush; a splash, and up he rises with heavy flappings, bearing away his well-caught prey to some favourite rock or tree, beneath which the bones of many a fish and snake testify to the Eagle's feasts. It is partial to the sea-snake (*Hydrophis*), which, basking on the uncovered reef, is an easy prey; it likewise captures crabs, or feeds, if hungry, on any thing dead which it finds on the shore; but its favourite food is fish, for which it will pursue even the Osprey and rob it, as Jerdon remarks, of its well-earned food. During the heat of the day this Eagle often soars to a great height, and as it rises in wide circles, its pinions upturned to the extreme, its flight is grand and majestic*. Its loud cry of *clank, clank, clank,* which is repeatedly uttered in the breeding-season, can be heard at a considerable distance, and often leads to the discovery of its eyrie. It lives admirably in confinement, thriving even when wounded and captured as an adult, and feeds gluttonously on either cooked or raw meat. Mr. Holdsworth mentions one bird in his notes which was reared on the universal rice and curry of the native; and I have no doubt he was rightly informed, for little came amiss to my tame one. He was a cowardly bird in his disposition, standing in wholesome fear of a fierce little Crested Eagle in the same aviary with him, and also allowing himself to be bullied out of many a morsel by a Gannet which at another time kept company with him. A notice of this fine Eagle would be incomplete without quoting from Layard's graphic description of its habits. He says, "The flight of this species is noble and imposing; poised high over the resounding surge, it wheels above on circling pinions, and with extended neck surveys the finny tribes. Here shoals of beak-nosed fishes swim in their seasonal migrations along the coral reef; there brilliant Chætodons float in the shallows. The tide has partially receded, and the water lies in still crystal pools in the depressions of the reef: over one of these the Fish-Eagle passes; an abrupt wheel shows his attention arrested; a moment's pause, and down he plunges, his body swaying to and fro. The surface is reached, the legs suddenly thrown out, and with exulting cries he soars aloft, bearing in his talons a writhing snake, eel, or large fish. The efforts of the bird to secure its prey in a proper position are now curious. If a fish is captured the feat is comparatively easy; the talons of the Hawk are gradually shifted until one grasps the prey near the gills and the other near the tail. . . . . With a snake or eel the matter is more difficult, and I have often seen the prey free itself from its captor by its strong writhings; a bite, however, near the head destroys its power, and it is borne away dangling by the neck in the grasp of its destroyer." I observed that my tame birds invariably commenced eating a fish by tearing it at the back of the neck, the head being pointed to the bird's left; small fish, however, up to 5 or 6 inches, they would bolt entire, jerking them down head foremost.

Mr. Hume, in his interesting account of his trip to the Laccadives, contained in 'Stray Feathers,' 1874, has the following observations on the habits of this Eagle at Pigeon Island. At page 423 he writes, "One that I shot as he swept overhead, high above the stunted trees that concealed me, had in his claws the entire liver and stomach of a goat. . . . . . It is a fine sight to see these Eagles striking one after the other in rapid succession. Soaring far above the island, often, I should judge, from a height of at least 1000 feet they come down with nearly closed wings, and with a rushing roar, like that of a cannon-ball, in a perfectly direct line, making an angle of about 60° with the water, which they scarcely seem to reach before they are again mounting with heavy flaps, and with a yard or two of snake hanging *dead* in their talons. One snake I recovered, shooting its captor, less than a minute after it had been seized. It was stone dead (though we all know how tenacious

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* Gould, in his grand work on the 'Birds of Australia,' remarks that the great breadth and roundness of its pinions and the shortness of its neck and tail give this Eagle, when floating in circles high in the air, the resemblance of a large butterfly.

of life these reptiles are), and had its head and neck pierced through in several places by the Eagle's cruel claws, its whole skull being completely crushed up."

Messrs. Hume and Ball both allude to the shy disposition of this Eagle. The former says that at the Andamans it is exceedingly difficult to procure; and in writing of it as an inhabitant of Chota Nagpur, Mr. Ball remarks that it is extremely wary and difficult to approach. In Ceylon it is certainly when perched a shier bird than *P. ichthyaetus*; but it will frequently fly close overhead, and then affords an easy shot.

Instances have been likewise known in Ceylon of its having carried off wounded birds. Captain Wade writes me that he saw one in the Yala district take away a fallen Duck; and Mr. Bligh relates to me a similar case in which another of these Eagles pounced on a Stone-Plover (*Esacus recurvirostris*) which had been fired at and had fallen in the surf. The robber turned inland with his booty, and flying over the sportsman's head dropped it, on being fired at, almost at his feet.

Nidification.—In Ceylon this species breeds during the months of December, January, and February. It selects for its eyrie an enormous banyan or other tree with stout limbs and taller than the surrounding forest, and there builds a huge nest, sometimes 5 or 6 feet in diameter, and often, to secure a firm foundation, as many deep. The interior is almost flat, and contains a bed of green leaves, in which the eggs are laid, and with which the bird hurriedly but skilfully covers them on leaving or being frightened from the nest. This lining is removed when the young are hatched, and they repose on the twigs beneath.

One of several eyries which I discovered in the neighbourhood of Trincomalie was visited on two successive years; and on the occasion of my second visit I found that the male bird, whose mate I had robbed him of, had procured another, who was quite at home in her new quarters. The nest was at the top of the junction of an enormous aerial root with the parent limb, and up which my coolie progressed at a great speed: the bird sat very close, not stirring from the nest until the man was up to it; while he was ascending the male brought a huge fish to the nest, but on perceiving the intended robbery, flew off with it, leaving the hen still setting. Both birds flew round the nest, swooping down near it and uttering their loud clanking notes; but they did not, as also on all other occasions in my experience, attempt to molest the man. Even when losing their young these Eagles do not exhibit much courage, although they do not fly off, and calmly settle on a distant tree, as I have seen *Polioaetus ichthyaetus* do. The eggs are nearly always two in number, but sometimes only one, as I, on one occasion, took a single incubated egg from a nest. They are dull white and vary in shape, some being very round, while others are long ovals or pointed at one end; the shell is tolerably rough, and, in general, much stained and soiled. They vary from 3·17 to 2·77 inches in length, by 2·18 to 2·02 in breadth.

On Pigeon Island there is a large nesting-colony of these birds; they breed in the lofty trees growing on the island, as many as thirty or forty nests being placed in close proximity to each other. Their breeding-time here, according to Jerdon, is during the months of December, January, and February, or the same as it is in Ceylon. Concerning the nesting of the White-bellied Sea-Eagle in the Andamans and Nicobars, Mr. Davison writes to Mr. Hume, "I found this bird nesting on Nancowry Island on the 8th of March; the nest was a huge mass of sticks, placed between two great branches of a large tree, at an height of about 80 feet from the ground. . . . . . I could not climb the tree myself, and I could get no assistance from the Nicobarese; they would not go near the nest; and when I said I would have it taken without their assistance, they earnestly begged me not to touch it, as doing so would be sure to bring fever into the village, and they would all die." This strange idea of the Nicobarese evidently arises from their acquaintance with the incongruous mass of fish-bones, snakes, skeletons, crab-shells, &c. which are always to be found beneath these great eyries, and which are not always of the most odoriferous kind.

Although this species breeds, as a rule, on lofty trees, it alters its habit according to the locality to which it is obliged to confine itself. Mr. Gould, in writing of it as an Australian bird, says, "I could not fail to remark how readily the birds accommodate themselves to the different circumstances in which they are placed; for while on the mainland they invariably construct their large flat nest on a fork of the most lofty trees, on the islands, where not a tree is to be found, it is placed upon the flat surface of a large stone, the materials of which it is formed being twigs and branches of the Barilla, a low shrub which is there plentiful."

ACCIPITRES.

FALCONIDÆ.

AQUILINÆ.

Genus POLIOAETUS.

Bill not so long nor straight as in *Haliaetus*, but deeper and more powerful in proportion to its size; culmen boldly arched from the cere; festoon slightly pronounced; nostrils oval and exposed; cere moderately advanced. Eyelid devoid of lashes. Wings moderate, rounded, the 4th and 5th quills the longest, the 1st subequal with the 9th. Tail moderately long, considerably exceeding the closed wings, rounded at the tip. Tarsus very stout, its upper third feathered in front, the rest covered with broad rectangular scutæ, the posterior with large irregular scales. Toes stout, protected above by rectangular scales nearly to the base. Claws long, much curved and rounded beneath.

POLIOAETUS ICHTHYAETUS.

(THE BAR-TAILED FISH-EAGLE.)

Falco ichthyaetus, Horsf. Tr. Linn. Soc. xiii. p. 136 (1822); id. Zool. Res. Java, pl. 34 (1824).

Pandion ichthyaetus, Vig. Zool. Journ. i. p. 321 (1824); Horsf. & Moore, Cat. B. Mus. East Ind. Comp. p. 53. no. 65 (1854); Schleg. Vog. Nederl. Ind., Valkv. pp. 13, 62, pl. 5. figs. 1, 2 (1866).

Haliaetus ichthyaetus, Cuv. Règne An. i. p. 327 (1824).

Haliaetus unicolor, Gray & Hardw. Ill. Ind. Zool. i. pl. 19 (1830).

Ichthyaetus horsfieldi, Blyth, J. A. S. B. xi. p. 110 (1842).

Pontoaetus ichthyaetus, Gray, Gen. B. i. p. 17 (1845); Blyth, Cat. B. Mus. A. S. B. no. 121, p. 30 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 101; Kelaart, Prodromus, Cat. p. 115.

Palioaetus ichthyaetus, Kaup, Contr. Orn. 1850, p. 73; Jerd. B. of Ind. i. p. 81 (1862); Blyth, Ibis, 1866, p. 243; Hume, Rough Notes, ii. p. 1 (1870); Holdsworth, P. Z. S. 1872, p. 412; Hume, Nests and Eggs, p. 43 (1873); Sharpe, Cat. Birds, i. p. 452 (1874); Legge, Ibis, 1875, p. 278; Hume, Str. Feath. 1875, vol. iii. p. 28; Legge, ibid. p. 362.

White-tailed Sea-Eagle, *Fishing-Eagle*, Europeans in India; *Tank-Eagle* in Ceylon.

Matchmorol, "Fish-Tyrant," Bengal; *Madhuya*, Hind.; *Jokowuru*, Javanese.

Rajaliya, Sinhalese; *Ala*, Tam. in Ceylon.

Adult male. Length to front of cere 23·0 to 24·0 inches; culmen from cere 1·8; wing 17·0 to 17·5; tail 9·5 to 10·0; tarsus 3·5; mid toe 2·3 to 2·4, claw (straight) 1·2; inner claw (straight) 1·3; height of bill at cere 0·65.

Adult female. Length to front of cere 25·5 to 26·0 inches; culmen from cere 1·8; wing 18·0 to 18·3; tail 10·0; tarsus 3·5; mid toe 2·3 to 2·5. Expanse 58·5.

These measurements are from Ceylon examples.

Iris clear yellow, sometimes tinged with reddish and mottled with brown; bill dark horn, paling to bluish near the cere

and bluish fleshy at gape; cere above leaden, at lower edge bluish; legs and feet fleshy white, with a bluish tinge; claws black.

Entire head, upper part of hind neck, and throat cinereous ashy, the crown and nape shaded with brown; back, rump, scapulars, and wings dark wood-brown, passing on the interscapular region into a paler shade, which blends above into the grey of the neck; in old birds the latter part is especially pale, and sometimes has the feathers edged light; primaries dull black; secondaries blackish brown, the inner webs somewhat cinereous; chest, breast, and upper flanks light wood-brown, blending into the grey of the throat; abdomen, lower flanks, thighs, under tail-coverts, and tail white, terminal portion (from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches) of tail black; lesser under wing-coverts umber-brown. When freshly acquired, the hues of the upper surface are much darker than when the bird is in old-feather, in which state the breast fades considerably, becoming a light chocolate-brown. The chin is whitish in some birds, probably those which have for the first time acquired the adult plumage.

Young. In the bird of the year the iris is hazel-brown; bill and legs much as in the adult.

The nestling is covered with white down.

On becoming fully plumaged at about four months' old, the upper part of the forehead, crown, hind neck, and interscapular region are light chocolate-brown, deepening slightly on the scapulars, back, and wing-coverts; edge of forehead, throat, face, and above the eye, together with the tips and centres of the head and hind-neck feathers, and the tips only of those of the lower part of the neck, buffy white; tips of the back, scapulars, and wing-covert feathers fulvous-grey, passing with a tawny hue into the brown; quills blackish brown, all but the longer primaries and the secondaries tipped with the fulvous hue; the primaries, secondaries, and greater wing-coverts crossed on their inner webs with light bars, paling into whitish at the inner edges; tail brown, tipped with fulvous, paling beneath the coverts into whitish, and mottled, except on the bars, with fulvous; a broad, blackish, terminal band, preceded by a narrow undefined bar of the same, on the central feathers only.

Lower part of fore neck, chest, flanks, and breast more or less pale tan-brown, with shaft-stripes and tips of fulvous-grey, which are usually broadest on the chest; bases of the chest-feathers dark brown; abdomen and thigh-covert feathers white, mottled at the tips and terminal margins with the pale hue of the lower breast; under tail-coverts faintly washed with the same; under surface of tail at its base white, mottled towards the terminal band with grey; lesser under wing-coverts light tawny fulvous; greater series white, barred with black; axillaries pale tawny, marked across the centres of the feathers with brown and white.

At the end of the first year the plumage fades, sometimes to an extraordinary degree, the chest and breast becoming whitish, merely washed about the margins of the feathers with very pale tawny grey; on lifting up the feathers of the chest the brown bases are found in their original state; the upper surface does not undergo such a change, except that the light tippings, by reason of abrasion, are less conspicuous; the tail, however, becomes considerably paler than in the freshly-plumaged yearling. The adult plumage, as far as I can ascertain, is not put on until after the second moult.

Obs. In my notes on "Ceylonese Ornithology and Oology" (*loc. cit.*) I pointed out that Ceylon examples of this Fish-Eagle were, as a constant rule, smaller than those from other places. An examination of specimens in the National collection from the Malay region, and a perusal of the dimensions given of late in various articles in 'Stray Feathers,' confirms the opinion that our bird constitutes a small race of *P. ichthyaetus* of Java. This latter is not invariably a larger bird than the Ceylonese, as I have examined a specimen from Sumatra with a wing of 17·7 inches, and that of another collected by Mr. Armstrong in the Rangoon district measures only 18·2; on the other hand the type specimen from Java in the British Museum measures 20·0, and an immature bird, presumably a female, so young that it could not be sexed, shot by Mr. Oates in Burmah, had the wing as large as 19·0, both of which latter dimensions I have never known attained to in the Ceylon bird. The Javan bird has a less cinereous brown hue, both above and beneath, than several that I have examined from other places; but this is a worthless character, as the brown tints are variable in the Ceylon bird, depending entirely on the age of the feather.

As regards the position of this Eagle among its congeners, I have not placed it with the Ospreys, as Mr. Sharpe has done in his 'Catalogue,' but kept it in its hitherto accepted position among the Sea-Eagles. It differs structurally from the Osprey in having two foramina in the sternum, the posterior edge of which is devoid of the tolerably deep notches existing in that of *Pandion*, and in not having the keel, which is also much shallower, prolonged to the edge; the sternum is likewise weak, narrow, and more angulated than in the Osprey; the feathers do not want the accessory plumule, and the bony protection or brow above the eye, which does not exist in the Osprey, is present in this genus as in all other Raptors. In the structure of the foot, the outer toe of which is partially reversible, and also in the rounded claws, *Polioaetus* has some affinities with *Pandion*; but it differs again in its much shorter wings and the habits consequent on this structure.

Distribution.—The Fish-Eagle is chiefly an inhabitant of the northern half of the island, frequenting, on the east, the numerous land-locked bays, estuaries, salt lagoons, and large rivers which intersect the coast-line from Elephant Pass to Batticaloa, and on the west, but not so abundantly, similar localities as far south as Chilaw. In such situations as the Jaffna lagoon at its upper end, portions of the Mullaittivu and Kokelai lakes, the Peria Kerretje and other large salt lagoons, and the mouths of the Mahawelliganga it is numerous. It is found throughout the whole of the interior of this part of the island, haunting the large tanks at Kanthelai, Minery, Topare, Anaradjapura, and likewise most of the smaller sheets of water, the village tanks of not more than a few acres having generally each their pair of these noisy birds. In the Eastern Province it is found on the Rugam, Ambaré, and other tanks, and further south occurs, but not so numerously, at the river-mouths as far down as Hambantota. On the western side of the island, to the southward of Chilaw, I have seen it at the head of the Bolgodde Lake, and it is doubtless an inhabitant of the large sheet of water near Amblangoda.

As regards the mainland, the Bar-tailed Fish-Eagle has chiefly an eastern distribution. I find no record of its being found on the western coast; and though so common in Ceylon, it appears to be almost unknown in Southern India. Dr. Jerdon remarks, in the 'Birds of India,' "I never observed it myself south of Nerbudda. I saw it frequently in the Saugor territories and in Bengal. It extends to Burmah and the Malay countries." Concerning its *locale* in the north of India, Mr. Hume writes, in 'Nests and Eggs,' "I have myself never seen a specimen of the Bar-tailed Fishing-Eagle from any locality westward of Nepal, though I have it from Sikhim and Rangoon; it is the next (*P. plumbeus*) and not the present species which is so common along the bases of the Himalayas, from Kumaon to Afghanistan." In North-eastern Cachar it is rather rare, but occurs, both there and in the Sikhim Terai, in conjunction with *P. plumbeus*. In the Tenasserim provinces it appears likewise to be uncommon, a single locality for it (Paybouk) being given in the "First List" of the birds of that region ('Stray Feathers,' 1874). It inhabits the coasts of the Malay peninsula, but does not appear to take the Andaman and Nicobar Islands into its range, as since its supposed occurrence there chronicled by Captain Beavan in 'The Ibis' for 1867, on Col. Tytler's authority, no specimens have ever been met with. In Java, the "Jokowuru" is, according to Horsfield, by no means generally distributed, the only two localities at which this naturalist met with it being "on the banks of the river Kediri, in the eastern district, and the other near the middle of the island, on the hills of Prowoto." It has been procured in Sumatra, Borneo, and Celebes, and probably occurs in all the intermediate islands.

Habits.—This fine Eagle frequents the borders of wooded estuaries and salt lagoons, the narrow mouths of rivers which are lined with forest, and the shores of inland lakes and tanks. The open coast it rather shuns, leaving the sway over that to its nobler ally the Sea-Eagle. The wild and secluded tanks of the interior are, however, best suited to the habits of this inveterate fish-eater. At these solitary reservoirs, many of them the persevering work of Lanka's ancient kings, the Fish-Eagle is to be found, sitting motionless on the limbs of the noble trees which line the retaining bunds, every now and then calling to its mate with its singular, far-resounding shout. While the lazy and uncouth crocodile sleeps on the bank beneath, the Eagle overhead eagerly watches its opportunity, with eye intent on some lotus-covered nook, above which hum, in the morning sun, myriads of insects, luring the finny tribes to the surface. On getting sight of a rising fish, the watchful bird launches itself down with a rapid swoop, not pouncing as an Osprey, but raking up the prey with its talons, like the Sea-Eagle. In May and June, when the village tanks of the Vanni are fast drying up under the influence of the parching south-west wind, and one muddy pool, alive with half-dead fish and frogs, is all that is left of the broad December lake, the "Fish-Hawk," in company with a host of Cormorants, Kingfishers, Egrets, and Pond-Herons, spends a prosperous time, and becomes so fat and lazy, that I have seen one fired at with a rifle, from some little distance, refuse to leave his post. In spite of its ample wings, it seldom soars or takes long flights, contenting itself with frequent peregrinations round the tank or lake on which it has taken up its permanent quarters; but when chased or harassed by the Sea-Eagle, as I have seen it by a pair of these birds which were breeding at Minery, it exhibits considerable adroitness on the wing. It never stoops on its prey with the velocity of either the Osprey or the Sea-Eagle, but glides leisurely over it with outstretched legs. It perches with a very erect pose, and usually, when not watching for fish, seats itself on the top of a tree. Its singular note is one of the characteristic sounds of the forest-begirt tanks in the north of Ceylon. It is a deep, resounding call or "shout," louder than any bird-note in Ceylon, and when heard at intervals

during the night, breaks in with startling effect on the stillness of the forest. It is repeated three or four times, and somewhat resembles the monosyllables *koow, koow*. I have not noticed this peculiar cry referred to by Indian writers; and as regards the Javan bird, Horsfield says, in his 'Zoological Researches,' that its cry is like that of the Osprey. The same author confirms my experience of its timid nature, relating that a male bird "on being caught in a snare permitted itself to be seized by the native without making any resistance. When brought to me lying in the arms of the native, apparently conscious of its situation, and without making use of its claws or bill, or exerting any efforts to extricate itself, it suffered itself to be handled and examined very patiently."

In confinement this Eagle thrives well, and is a very docile and quaint bird in its habits. A young one which I reared soon learnt to recognize the person who fed it, and would swallow fish 6 inches in length as fast as they were thrown to it, quickly filling out its crop, and working it, by a muscular effort, to and fro, so as to pass the food into its stomach. It was kept in the same aviary as the Crested Eagle now in the Zoological Gardens, and would, long after it was fully plumaged, sidle up to it, crouch down, chuckling with a low note, as it would do to its parent. As it grew old, it became the noisiest bird I ever had any thing to do with, continually "cawing" for its food, notwithstanding that it was plied with raw meat, lizards, and fish to an alarming extent, and was almost as ravenous a feeder as a Pelican Ibis, if any bird *could* be found to equal the latter in point of appetite. Up to the age of six months, when he, to my great regret, fell a victim to an accident, he very seldom gave vent to the loud call of the wild bird, his note in confinement being a harsh clanking cry.

Nidification.—This Eagle breeds in December and January, building a huge nest of sticks in large trees near the water's edge. If the structure is fixed in a deep fork or awkward situation on the limbs of the tree, the foundation is heaped up until sufficient breadth is attained for the platform, and the result is a fabric of enormous size. I have never obtained the eggs; but a nest which I visited in 1873 contained one nestling, the tame bird above described, and it may therefore be premised that the bird lays two eggs, the other, in this instance, having been addled. The interior of this nest, which was entirely made of good-sized sticks, was flat, and contained no lining or preparation for the repose of the eaglet, which, on my appearing at the edge of its domicile, stood up and placed itself in an attitude of defence, its cowardly parents flying off and seating themselves on distant trees. As to the eggs they are, in all probability, white and unspotted, and about the size of those of *Pol. plumbeus*, its Himalayan congener, which vary, according to Mr. Hume, "from 2·72 to 2·8 inches in length, and from 2·1 to 2·15 in breadth."

I have never seen more than one nest belonging to this Eagle in the same locality; but occasionally it appears they congregate together in the same manner that the Grey-backed Sea-Eagle does—an abnormal habit, arising no doubt from the force of circumstances. Jerdon mentions having found a whole colony of the nests of this Eagle in a single tree on the skirts of a village near the Ganges.

ACCIPITRES.

FALCONIDÆ.

AQUILINÆ.

Genus HALIASTUR.

Bill stout, rather lengthened, the direction of the cere straight, the culmen descending from its edge; festoon prominent. Nostrils oval and oblique, exposed. Eyelid furnished with short lashes. Wings long, reaching nearly to the tip of the tail, the 4th quill the longest. Tail short and broad at base, rounded at the tip. Tarsus short, feathered in front slightly below the knee, moderately stout, protected in front by rectangular transverse scales, behind with broad pentagonal scutæ. Toes rather short, the outer considerably longer than the inner, the whole covered with transverse scales. Claws shortish, moderately curved and trenchant beneath.

HALIASTUR INDUS.

(THE BRAHMINY KITE.)

Falco indus, Bodd. Tabl. Pl. Enl. 25 (1783).

Falco pondicerianus, Gm. Syst. Nat. i. p. 265 (1788).

Haliaetus ponticerianus, Cuv. Règne An. i. p. 316 (1817).

Milvus pondicerianus, Jerd. Madr. Journ. x. p. 72 (1839).

Haliastur indus, Gray, Gen. B. i. p. 18 (1845); Blyth, Cat. B. Mus. A. S. B. p. 31; Kelaart, Prodromus, Cat. p. 114 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 101; Horsf. and Moore, Cat. B. Mus. E. I. Co. i. p. 57 (1854); Jerdon, B. of Ind. i. p. 101; Hume, Rough Notes, ii. p. 316 (1870); Holdsworth, P. Z. S. 1872, p. 414; Hume, Nests and Eggs, p. 51 (1873); Sharpe, Cat. Birds, i. p. 313 (1874); Legge, Ibis, 1874, p. 10, et 1875, p. 279.

Haliaetus indus, Schl. Mus. P.-B. *Aquilæ*, p. 19 (1862).

L'Aigle de Pondichery, Briss. Orn. i. p. 450, pl. 35 (1760).

Aigle des Grandes Indes, Buff. Pl. Enl. i. pl. 416 (1770).

Shiva's Kite, Kelaart, Prodromus; *Pondicherry Eagle*, Lath.; *Maroon-backed Kite*, Jerdon, B. of Ind.

Bahmani-chil, Hind.; *Ru-Mubarik*, Mussulmen; *Sunker-chil*, lit. "Shiva's Kite;" *Dhobia-chil*, lit. "Washerman's Kite," Beng.; *Khemankari*, Sanscrit; *Ratta ookab*, Sindh; *Garud-alawa*, Tel.; *Shemberrid*, Yerklees (*apud* Jerdon). *Lang-bondol*, Sumatra; *Ulung*, Java (Horsf. & Moore, Cat.).

Rajaliya, Sinhalese; *Chem Prāndu*, Tam.; *Brimalgumoitu*, Portuguese in Ceylon (*apud* Layard).

Adult male. Length to front of cere 18·0 to 18·5 inches; culmen from cere 1·1; wing 14·5 to 15·0; tail 8·0 to 9·5; tarsus 2·0 to 2·25; mid toe 1·2, claw (straight) 0·7; height of bill at cere 0·5.

Adult female. Slightly larger only. Length to front of cere about 19·0 inches; culmen from cere 1·2; wing 15·0 to 15·3.

Iris brown and mottled in some with yellow; cere yellowish; bill bluish horn, palest at the base beneath; legs and feet greenish yellow.

Plumage above, from the forehead to the lower part of the hind neck, and beneath down to the abdomen, including the flanks, white, each feather with a narrow, blackish, mesial stripe, which includes a fine portion of the web as well as the shaft; in mature birds these are as broad on the head as on the hind neck, but in very old examples are confined to the shaft only; rest of the plumage, with the exception of the longer primaries, greater series of under wing-coverts, and lower surface of tail maroon-red, darkest on the back, lesser and under wing-coverts, and palest on the abdomen, thighs, and under tail-coverts; the shafts, except of the tail, black, these latter fulvous-white; tip of tail the same; longer primaries black, their inner webs rufous from the base to the notch, the under surface rufescent, paling to whitish at the base; primary wing-coverts dark at their outer edges, the inner webs, as well as those of the secondary feathers, crossed with narrow, widely-separated bars of blackish.

Obs. In some examples the black stripes are conspicuously developed on the red feathers of the abdomen, while in others the shafts alone are dark. I have noticed this characteristic chiefly in Bengal examples, which, as a rule, I think, have the stripes on the white plumage bolder than in Ceylonese birds, although they coincide exactly in the hue of the maroon parts. The Ceylonese bird, as regards the white striping (the variation in which has been considered by Mr. Gurney of sufficient value to justify the separation into species of the two Malayan races, *H. intermedius* and *H. girrenera*), comes between the Bengal and the Malaccan bird. The latter (*H. intermedius*), besides having the shaft-stripes reduced to very narrow lines, is of a redder or paler hue than *H. indus*, and appears to be a well-marked race or subspecies.

Young. The nestling has the iris dark brown, the bill and cere brownish, the latter and the loral skin tinged with green; legs and feet greenish.

Body at first covered with white down; when fully plumaged, the forehead, chin, and lower part of cheeks are dull whitish, the ear-coverts brownish, and the head and hind neck fulvous tawny overcome with brown on the lower part of the latter, the centres of the feathers light, and the edges tawny, imparting a streaked appearance; the brown feathers of the hind neck with rufescent central streaks, diminishing to terminal spots on the interscapular region, which, with the back, scapulars, wing-coverts, and secondaries, is dark brown, paling much on the upper tail-coverts; the scapulars margined terminally with rufous; quills and tail blackish brown; inner edges of primaries white; greater wing-coverts with pale inner margins and conspicuously black shafts; throat and breast isabelline brown, with tawny shaft-stripes, lower parts with the thigh-coverts tawny, with dark shaft-stripes on the thighs. This plumage at the end of the first year, as ascertained by observation of a caged bird, becomes paler throughout.

After the first moult the head and hind neck are rufous, paling at the tips, and with blackish shaft-stripes, the back, scapulars, and wing-coverts a sober brown, with pale terminal margins, the greater wing-coverts with much white on the concealed portions of the inner webs, the upper tail-coverts with broad pale margins, shorter primaries with rufous-brown, outer webs and the inner webs rufescent white at the base; ear-coverts paler than in the first plumage; under surface pale brownish, with light terminal streaks, and the shafts dark in the brown portion of the feather; the abdomen paler than the breast; under tail-coverts and lesser under wing-coverts rufous, median under wing-coverts brown edged pale, greater series pale as in the adult.

After the second moult, the back, wings, and tail assume their rufous or maroon colouring, the head and hind neck are whitish, washed here and there with rufous, and with black shaft-stripes; the face and throat are white, gradually darkening into rufescent fulvous on the chest and upper breast, on which there is again a gradual change to the maroon of the lower parts, the shafts of all the feathers being black. After this stage, the head, hind neck, and breast get whiter by degrees, throwing off all trace of the rufous hue, and the shaft-stripes assume their normal character, covering a portion of the web at the sides of the shaft, which alone is dark in the intermediate stages.

Distribution.—The Brahminy Kite is a well-known and very common bird in Ceylon, being more or less abundant round the whole coast of the island, and occurring about the large tanks and inland waters of the interior. On the seaboard, however, it is local in its choice of habitat, as an instance of which feature I may cite its abundance in Galle harbour, and almost total absence from the equally inviting roadstead at Colombo. It is sometimes seen about the mouth of the Kelani, and in the marshes at the back of Borella, and it occurs sparingly at Negombo and more commonly at Bolgodde; but I never once saw it about the shipping in the Colombo Roads. At Chilaw it commences to be commoner, and continues to increase in numbers at Puttalam and northwards to the Manaar district, where, as well as throughout the whole of the northern maritime region, it is very numerous. At Trincomalie it is abundant, and is a common bird down the coast to the Batticaloa Lake. South of this and in the Hambantota district it is scarcer. I have met with it at Kanthelai, Minery,

and other tanks in the northern interior, and I believe it also frequents the Bintenne Lake. In the south-western district it is found about the Sinhalese villages on the Gindurah as far up as the "Haycock" hill; and I have known it to breed as far inland as Oodogamma. I am not aware of its ever having been seen on the upland of Dumbara, or anywhere else in the Kandyan hill-region, although there is no reason why it should not follow as a straggler the course of the Mahawelliganga from the low country to the north of Bintenne, up to the neighbourhood of the highland capital.

The Brahminy Kite is found throughout India on the sea-coast and on all large rivers and jheels, extending eastwards to Burmah, and as far south as the lower parts of the province of Tenasserim, where it is, however, not very common. In the south it is abundant, and at the island of Ramisserum I have always found numbers of this bird. Jerdon remarks that it is rare in the plains of India and in the Deccan, in which latter region Mr. Fairbank, in 'Stray Feathers,' records it as uncommon. In the north-western portion of the empire, Mr. Hume speaks of it as follows ('Stray Feathers,' 1875, p. 448):—"Common enough in Sindh and about the coasts of Cutch and Kattiawar, but almost (if not quite) unknown in the dry riverless regions of Rajpootana. Adam never obtained it about Sambhur, and at Ajmere I only once remember seeing it. Dr. King does not appear to have observed it in any part of Jodhpoor." In Chota Nagpur, Mr. Ball remarks that it is found "near the larger rivers and jheels, but nowhere in abundance." In Lower Bengal it is of course plentiful. Further eastward, Mr. Inglis records it as common throughout the year in Eastern Cachar; and in Burmah Mr. Oates writes that it "occurs in immense numbers in all the tidal creeks of the Pegu plains."

Habits.—In Ceylon the Brahminy Kite is especially a denizen of seaport towns and large villages at the mouths of rivers and salt lakes; it frequents, likewise, land-locked bays, estuaries, and lagoons; but in all of such localities seems to prefer the vicinity of human habitations, probably on account of its garbage-eating habits, to the solitude of the surrounding plains. It collects in great numbers among shipping, flying round the vessels on the look-out for garbage of all sorts, soaring in high circles above their masts, and even settling on the rigging, where it keeps a sharp eye on the galley about the dinner-hour, and is ready to pounce immediately on any thing that may be thrown overboard.

It picks up its food with a graceful swoop, and very frequently devours it while in full flight, proceeding about this operation in the most leisurely manner possible; it may be seen bringing forward its talons with the food it has seized beneath the breast, and with a combined backward and upward pull from the legs and shoulders respectively, fragments are torn off with but little exertion. I have observed it swoop down and pick up a Lizard (*Calotes*) basking on the topmost twig of a low tree, this favourite prey among eastern Hawks no doubt forming a considerable portion of its sustenance. It will capture fish in shallow pools, and is very fond of the small crabs frequenting the foreshores of tidal rivers; it may be often seen devouring its food on the ground or on a large rock or the bank of a paddy-field. It is a tame bird, and exhibits but little fear of man or a gun, sometimes making off with a Snipe which has fallen at some little distance from the sportsman. At Trincomalie it was always a morning attendant at the drawing of the sea-nets; and was just as agile in snapping up any outside fish as its more numerous companions the Crows, and when not particularly successful in its foraging, would pursue a Crow and rob it of its well-earned "sardine." Layard says that he has known it seize a fowl; but, as he remarks, this must be a rare occurrence. Jerdon has seen it "questing over woods and catching insects, especially large *Cicadæ*." It is continually on the wing, and has an easy, buoyant, and powerful flight, being much in the habit of soaring up to a great height, and then launching itself off for a long distance with motionless wings. Its chief characteristic as regards locomotion is its habit and power of sailing steadily up against the wind, with scarcely a movement of its frame, except a twisting of its head from side to side, as it carefully scans the ground beneath and awaits its chance of darting down on some coveted morsel. I have on other occasions witnessed it exhibit considerable skill in catching up a lizard in the air, which it had let fall from its talons while flying off with it. Its favourite note is a weak squealing cry, which it constantly utters on the wing, or while perched on some building or tree-top. In Ceylon it sits much on the fronds of cocoanut-trees in the vicinity of native bazaars, and at night takes itself off in flocks to roost in some favourite spot in the jungle. Numbers of these birds frequented the town of Trincomalie, haunting the harbour and the sea-beaches of Dutch and Back Bays, where they subsisted chiefly on the fish picked up from

about the fishermen's nets; about 4 or 5 P.M. they commenced to fly away one after the other to the north, and, passing over the "Salt Lake," retired for the night to the forest between there and Peria Kulam.

Altogether the habits of this bird are as singular as they are interesting, and tend to place it more among the Kites than the true Sea-Eagles. Jerdon very aptly remarks, it may be considered either an aberrant form of *Haliaetus* leading to the Kites, or an aberrant Kite leading to the Sea-Eagles: and this is the position claimed for it in Mr. Bowdler Sharpe's 'Catalogue.'

Nidification.—This species breeds in Ceylon in February and March, nesting in trees on the shores of salt lagoons or paddy-fields. All the nests I have seen have been rather bulky structures, about the size of that of *Herodias alba*, made of tolerably large sticks, and placed in a top branch of moderately-sized trees. The number of eggs is usually two; but mention is made in Mr. Hume's book on Indian oology of four in one instance. The ground-colour is dull white, and the markings, which are scanty, consist of faded reddish or reddish-grey dots, sometimes scattered over the surface, and occasionally confined to the obtuse end; the spottings in some are mixed with small streak-shaped blots; and one egg, taken by Mr. MacVicar in the Western Province, has the appearance of being "dusted" all over with minute pale reddish specks. Five Ceylonese specimens varied in length from 2·04 to 1·88 inch, and in breadth from 1·7 to 1·54.

Layard states that this Kite makes several false nests, and that the male occupies one of them while the female is incubating her eggs near at hand. The chick or nestling has a querulous twittering cry. Concerning its nidification in India, Mr. Hume writes, "It almost invariably makes its nest in the neighbourhood of water, building a rather large loose stick-structure, scarcely if at all distinguishable from those of the Common Kite (*M. govinda*), high up in some large mango, tamarind, or peepul tree. The nest, which is from 18 inches to 2 feet in diameter, and from 3 to 5 inches in depth, with a rather considerable depression internally, is sometimes perfectly unlined, at other times has a few green leaves laid under the eggs, as in an Eagle's nest; but most commonly is more or less lined, or has the inner part of the nest intermingled with pieces of rag, wool, human hair, and the like."

ACCIPITRES.

FALCONIDÆ.

AQUILINÆ.

Genus MILVUS.

Bill longer and with the tip more hooked than in *Haliastur*; festoon less prominent, the cere more advanced at the sides. Nostrils moderately large, oval, and oblique. Wings very long and pointed; the 3rd and 4th quills the longest, and reaching nearly to the tip of the tail. Tail long and forked. Tarsus short, the front and sides plumed considerably below the knee, the rest covered in front with transverse scutæ and behind with hexagonal scales. Toes longer than in *Haliastur*. Claws similar.

MILVUS GOVINDA.

(THE INDIAN PARIAH-KITE.)

Milvus govinda, Sykes, P. Z. S. 1832, p. 81; Kelaart, Prodromus, Cat. p. 115 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 103; Schlegel, Mus. P.-B. *Milvi*, p. 2 (1862); Gould, B. of Asia, part iv.; Jerd. B. of Ind. i. p. 104 (1862); Blyth, Ibis, 1866, p. 248; Hume, Rough Notes, ii. p. 320 (1870); Holdsworth, P. Z. S. 1872, p. 414; Hume, Nests and Eggs, p. 52 (1873); Sharpe, Cat. Birds, i. p. 325; Legge, Ibis, 1874, p. 10; Hume, Str. Feath. 1875, p. 229, footnote.

Haliaetus lineatus, Gray & Hardw. Ill. Ind. Zool. i. pl. 18 (young).

Milvus cheela, Jerd. Madr. Journ. x. p. 71 (1839).

Milvus ater, Blyth, Cat. B. Mus. A. S. B. p. 31 (1849).

Common Kite, *Black Kite*, Jaffna Europeans; *The Cheela Kite*, Kelaart's Prodromus.

Chil, Hind.; *Malla Gedda*, Tel.; *Paria Prāndu* (*apud* Jerdon).

Rajaliya, Sinhalese; *Kalu-Prāndu*, *Paria Prāndu*, Tam. in Ceylon.

Adult female. Length to front of cere 22·0 to 22·5 inches; culmen from cere 1·2; wing 17·5 to 18·0; tail 10·0 to 11·0; tarsus 2·0 to 2·2; middle toe 1·5, its claw (straight) 0·7; height of bill at cere 0·5; expanse 55·5 (of an example with a wing of 18·0).

Adult male. Length to front of cere 21·0 to 22·0 inches; wing 16·0 to 17·3; tarsus 2·0 to 2·2.

Iris light hazel-brown, sometimes tawny, with brown radii and mottlings between them; cere pale greenish, dusky above; bill blackish, gape and base of under mandible bluish; legs and feet whitish green, greenish yellow, or pale yellowish; claws black.

Head and hind neck brownish tawny, the feathers slightly pale-edged, and each with a fine dark shaft-stripe; on the hind neck the stripes expand slightly, and the ground-colour darkens into the glossy wood-brown of the back, rump, scapulars, and lesser wing-coverts; upper tail-coverts paler than the back, and the margins of the feathers of the foregoing parts slightly paler than the rest, those of the least coverts tawny; median wing-coverts lighter than the rest, the webs paling off from the shaft to fulvescent greyish at the edges; primary-coverts, secondaries, and shorter primaries dark brown, the latter somewhat paler on the outer webs; longer primaries blackish brown, the inner webs paling from the notch to the base, and the colour broken up with white interspaces and mottlings; inner secondaries and adjacent tertials crossed with narrow blackish-brown bars, the interspaces being ashen, paling to white on the shorter and innermost tertials; tail ashen brown, with a tawny hue near the shafts of the feathers, and the laterals paling to whitish at the bases of the inner webs, the whole crossed with narrow bars of

dark brown, more or less incomplete towards the margins; tips of all but the two outer feathers whitish; a line of blackish above the lores, and over the ears a dark brown patch; face greyish with the shafts dark; beneath brown, paling to tawny rufous from the lower breast to the under tail-coverts; the centres of the feathers dark brown and the shafts blackish, the web adjacent to the mesial stripes being somewhat paler than the margin; margins of the throat-feathers fulvous, and the basal portions of the webs whitish; on the belly and under tail-coverts the mesial stripes are wanting, the shafts alone being dark; least under wing-coverts deep tawny, the feathers dark-centred; greater series blackish brown with tawny edges; primary under wing-coverts ashen-brown with dark softened bands; basal portion of the 2nd and 3rd quills beneath more or less whitish, the amount of white varying much in individuals, some being quite as dark as *M. affinis*.

Young. In the first, or nestling plumage, the head, back, rump, and wing-coverts are dark brown with a purplish gloss, the feathers of the head and hind neck with terminal whitish-buff "points" or streaks, surrounding a shaft-stripe darker than the rest of the feather; those of the back and rump with terminal margins of a slightly more rufous hue, the wing-coverts and tertials with much deeper tips of fulvous, passing with a rusty tint into the brown, and surrounding a dark shaft-stripe; primaries and their coverts blackish brown, tipped with fulvous, slightly on the longer primaries, and deeply on the rest; the inner webs of the quills mottled with dusky greyish; tail obscure ashen-brown, tipped with fulvous and crossed with indistinct bars (as in the adult) of darker brown.

Loral streak and postorbital patch darker, and the latter more extensive than in the adult; throat and lower part of cheeks fulvous, with narrow shaft-stripes of brown; fore neck, chest, breast, and flanks brown, the centres of the feathers rufous, enclosing pointed shaft-stripes of blackish brown; on the lower parts the brown hue pales into brownish fulvous, and the shaft-stripes disappear; tibial plumes and under tail-coverts more rufous still; under wing-coverts dark chocolate-brown tipped with fulvous, the primary-coverts ashen-brown with the outer webs whitish, as is also the edge of the wing; basal portion of primaries beneath scarcely showing any white in some birds, and in others even more than in old birds.

In the following season the terminal margins throughout the upper surface are less conspicuous, and those of the back- and scapular feathers less rufous, the margins of the head- and hindneck-feathers, however, are often more fulvescent, and the dark stripes on the latter part less conspicuous than in the nestling; the tips of the secondaries are likewise less in extent; on the under surface the throat becomes more "lined," the streaks on the chest and upper breast diminish, and their pale borders contrast less forcibly with them, while the ground-colour of these parts is browner than in the youngest stage; the amount of white at the base of the quills beneath varies, but it is usually more extensive during this period.

When not fully adult, the signs of nonage show themselves in the pale tips of the back, scapulars, and tertials, the softened and less intense shaft-lines of the head and hind neck, and the pale borders of the dark chest-striæ; the markings of the throat are variable at this stage, the shaft-lines being marked in some and faint in others, while the ground-colour is at times conspicuously rufous; the quills are quite untipped in these birds, and the lower parts more rufous than in adults.

Obs. The difference of opinion among some ornithologists as to what Kites in India should be classed as *M. govinda* and what as *M. affinis* makes it somewhat difficult to define what the Ceylon birds really are, as they present some points of dissimilarity to the types of both these species. If typical *M. affinis* be represented by the small rufous-plumaged Kite inhabiting the east coast of Australia and the Malay Archipelago, and *M. govinda* by the ordinary brown-plumaged bird of the plains of India, having a certain amount of white (which, however, is a variable and uncertain characteristic in Ceylon birds) at the base of the primaries beneath, then the Ceylon Kite has more affinity with the latter than with the former.

From *M. affinis* it differs, as an adult bird, in the less rufous coloration of the head, hind neck, and lesser wing-coverts, and in youth in the less-rufescent character of the upper-surface tippings, a Macassar example being taken for comparison. It is likewise a larger bird, the wings of six examples of *M. affinis* measuring as follows—(Sydney) 15·8, (Australia) 15·0, (Australia) 15·2, (Timor) 16·5, (Macassar) 16·6, (Timor) 16·5. As regards the pale markings of the under wing, adults of *M. affinis* are on the whole darker than Ceylon birds, which, though quite as dark in the young stage, are variable when mature. From the type of *M. govinda* in the India Museum, and *similar examples* in the British and Norwich Museums, the insular bird differs in the more rufous edgings of the head- and hindneck-feathers, the paler median wing-coverts, more cinereous tail, more conspicuous striation of the upper part of the throat, more ashy hue of the dark chest-stripes, and more fulvous colour of the abdomen and under tail-coverts; but though these differences are numerous, they are less appreciable than are those in the case of the Australasian bird. The Ceylon *Milvus* is also a somewhat smaller bird than the Indian *M. govinda*, Sykes's type, a female measuring 18·5 inches in the wing, and others I have examined 18·0, 17·8, 17·8 and 17·4, while Mr. Hume gives the wing in five females as from 18·25 to 19·10.

In several examples of the young of Indian *M. govinda* I have observed that there is more whitish at the base of primaries than in adults; some juvenile Ceylonese examples have scarcely any, while others have more white than old birds; so that I incline to the belief that this character in the medium-sized Kite is entirely worthless.

In referring to the species *M. govinda*, and speaking of its type in the India Museum, I select the example of the medium-sized Indian Kite, which, I believe, Sykes's description relates to, and which has, on the bottom of the pedestal, the name *govinda* written in pencil by Dr. Horsfield. Sykes's description is too short to identify with certainty the specimen which it refers to; but the smaller bird agrees better with it than with the young example of *M. melanotis* mentioned by Mr. Brooks ('Stray Feathers,' 1876, p. 272). Then there is, in favour of the smaller bird being the type, the indisputable evidence of the habits and locality of the bird referred to by Sykes. He says it is the Common Kite of the Deccan, and is "constantly soaring in the air in circles, watching an opportunity to dart upon a chicken, upon refuse matter thrown from the cook-room, and occasionally even having the hardihood to stoop at a dish of meat carrying from the cook-room to the house." This is not the habit of the larger Kite, which, according to most Indian observers, is a wary bird, and is furthermore not found in the district dealt with by Sykes. Mr. Hume, who has, I conclude, the largest series of Kites of any one in India, says, "I have examined more than 30 specimens of Kites from Bombay, Matteran, Sholapoor, Sattara, and Poona, and I never found one *M. major* among them: nay, when at Bombay and Poona, I specially noticed the Kites, and, while I thought I recognized some *M. affinis*, I can positively affirm there were no *M. major*. . . . . Everywhere in the plains *M. major* is a bird of the jungle, very rarely approaching towns or even villages, and living more on frogs, locusts, &c. than on offal." With regard to the measurements given by Sykes, ornithologists so far back as thirty or forty years ago rarely measured birds in the flesh; and I agree with Mr. Hume that Sykes's bird must have been measured from the skin. The tail, which is 11 inches, is decidedly that of the medium-sized bird, and corresponds in size with that of Ceylonese examples.

Distribution.—The Pariah Kite of Ceylon has a somewhat local habitat, being almost entirely confined to the northern half of the island. Its headquarters are the Jaffna peninsula and the west coast of the Northern Province, as far south as Manaar. It is, singularly enough, notwithstanding its limited range, subject to a seasonal movement from the east coast to the west during the south-west monsoon. Although tolerably common from the peninsula down to Trincomalie, from October until March, scarcely a bird is to be seen in that quarter during the opposite season. I am likewise informed by my friend Mr. W. Murray, of the Ceylon Civil Service, who has made large collections of birds in the Jaffna district, that its numbers are greatly decreased during the same time of the year—a circumstance which may be explained by its retiring into the jungle to breed, and also by its undertaking a partial migration to the southern coasts of India. In the island of Manaar and in the adjoining district of Mantotte it is plentiful, Mr. Holdsworth recording it as very common at Aripo; to the southward of the latter place it occurs in less numbers, taking in the island of Karativoe into its range, down the coast to Puttalam, at which place it is again tolerably numerous in the cool season. South of this it is rare, occurring as far as Madampe and perhaps to Negombo, below which I have never observed it.

In Ceylon it is exclusively a sea-coast bird, except in the very north of the Vanni, where it may now and then be seen about the villages of the interior. I have no record of its occurrence south of Batticaloa, on the east side of the island. Nor does it ascend into the hills as it does in the Nilghiris and Himalayas.

In India this Kite is almost everywhere abundant. It is found alike at seaport and inland towns; and most villages even have their attendant flock, who act the part of scavengers in quickly disposing of everything which it is possible for a bird to digest. In the south it inhabits the Nilghiris, in which hills Mr. Davison says it is very common, ascending to their summits, and often roosting with *Haliastur indus*. In the Travancore hills, likewise, Mr. Bourdillon writes that the Pariah Kite occurs in numbers in the hot weather; and it is to be presumed that the present species is intended, as the larger bird (*M. melanotis*) is not found in the extreme south. Sykes, who first discriminated the species, says it is the common Kite of the Deccan, while at Bombay and up the coast to Sindh, as well as throughout the whole region of Mount Aboo and Northern Guzerat, and in the Kandhala district, it is recorded by various writers in 'Stray Feathers' as very common. It inhabits the southern slopes of the Himalayas, up which it ascends to an elevation of 6000 or 7000 feet. It has been procured by Mr. Ball as far west as in the Suliman Hills, which form the western boundary of the Punjaub. The same writer observes that it is common at Chota Nagpur, and that specimens from the jungle are often intensely dark. In Kashgar Dr. Scully obtained nothing but the large bird, although the late Dr. Stoliczka

mentions seeing what appeared to be true *M. govinda* in the hills between Yanjihissar and Sirikul; this, I am inclined to think, was a wrong identification. In the plains of India and at Calcutta it abounds; but from Burmah Mr. Hume has only received what he considers to be the rufous (Australian) species, *M. affinis*, which inhabits the Malay peninsula, the Archipelago, and the eastern coasts of Australia. From the Andamans *M. govinda* appears to be entirely absent; and doubtless, if a Kite is procured from the islands of the Bay of Bengal, it will be the Malayan bird, which, as I have just mentioned, inhabits the peninsula. At the Laccadives, Mr. Hume mentions that a Kite not uncommonly occurs, which must be either *govinda* or *affinis*; and as the former species is represented in Ceylon, it is doubtless the same bird which affects these islands.

Habits.—This Kite, in the north of Ceylon, as it does in India, plays the part of an extremely useful scavenger. There, as in the districts on the mainland frequented by it, it resorts to villages and towns, more particularly those situated on the coast, and, collecting in large flocks, performs the office of devouring all the offal, refuse of human food, thrown out of the doors of native houses, garbage, and decaying organic remains which it can possibly get hold of in the course of the day's peregrinations. At the hauling-in of the morning seine net it is also a constant and regular attendant, disputing with the usual crowd of "Kakas" for the possession of stray fish and crabs rejected by the fishermen. In the town of Jaffna, where it is exceedingly abundant and extremely useful in a sanitary point of view, it resorts in scores, nay, hundreds at times, to the grand old banyan tree upon the fort-ramparts, roosting in it at nights, and perching on its outspreading branches between "meals," sallying out thence to the sea-beach and various parts of the town, as well as to the open fields of the surrounding country. At the beach, attracted by the arrival of fishing-boats and small craft from the adjacent islands, they present a lively scene: scores of birds circle round and fly to and fro with squealing notes and eager glances at the boats beneath them; some glide over the roofs of the houses, and, taking a wider tour than their mates, return again, sailing back through the streets in utter disregard of the busy human throng; meanwhile their more fortunate companions, alighted here and there on the sand, are discussing dainty (?) morsels of the most various description picked up with a quick and sudden swoop, or robbed from their sable allies the Crows, who stand off at a respectful distance, ruefully "cawing" their disappointment and rage. Layard, who lived for a considerable period in the north of the island, markedly alludes to their daring when pressed by hunger, and says:—"They are bold enough to make frequent depredations on the fish-stalls; and in one instance I saw a lad of about thirteen years struck to the ground by the sudden pounce of a Kite, who bore off a good-sized fish from a basket the boy was carrying on his head." This statement of its boldness is corroborated by a letter which has lately appeared in 'Stray Feathers,' vol. v. p. 347, in which a correspondent states that a Kite, whose nest had been robbed by the son of a sepoy, persistently watched for the lad, swooping down and attacking him whenever he left the house, ample evidence of which maltreatment was afforded by the appearance of the lad's head and arms.

Jerdon has the following paragraph in his 'Birds of India,' on the habits of the "Chil" in India:—"When a basket of refuse or offal is thrown out in the streets to be carted away, the Kites of the immediate neighbourhood, who appear to be quite cognizant of the usual time at which this is done, are all on the look-out, and dash down on it impetuously, some of them seizing the most tempting morsels by a rapid swoop, others deliberately sitting down on the heaps along with crows and dogs, and selecting their scraps. On such an occasion, too, there is many a struggle to retain a larger fragment than usual; for the possessor no sooner emerges from its swoop than several empty-clawed spectators instantly pursue it eagerly, till the owner finds the chase too hot, and drops the bone of contention, which is generally picked up long before it reaches the ground, again and again to change owners, and perhaps finally revert to its original proprietor. On such occasions a considerable amount of squealing goes on."

The flight of the Pariah Kite is buoyant and easy, the points of its wings being much turned up, and its long tail swayed to and fro as it gracefully curves about and alters its course with motionless pinions. It devours much of its food on the wing; and what it cannot thus consume it disposes of on the ground. In the north of Ceylon the bare and broken leaves of the Palmyra palm afford it a favourite perch. When not occupied in seeking for garbage it quests about marshes and other open places near the sea-coast for frogs, water-snakes, small crabs, &c. Mr. Holdsworth has observed a large flock at Aripu, feeding on winged termites, which they

were taking in the air, with apparently but little exertion, by seizing them in their talons! The note of this Kite is a tremulous squeal, uttered much when on the wing, or when congregated to feed on any newly-found garbage, when they become very noisy, as observed by Jerdon in the above paragraph.

Nidification.—The Pariah Kite breeds, as I am informed, in the north of Ceylon about May, retiring into the jungle for the purpose, and often building on trees near village tanks or in the vicinity of villages. I have not myself seen their nests; nor have I any description of them as built in Ceylon; I therefore subjoin the following account from Mr. Hume's voluminous notes in his 'Nests and Eggs of Indian Birds:'—"They build, almost without exception, on trees; but I have found two nests (out of many hundreds that I have examined) placed, *Neophron*-like, on the cornices of ruins. The nest, mostly placed in a fork, but not uncommonly laid on a flat bough, is a large clumsy mass of sticks and twigs, the various thorny acacias appearing to be the favourite material, lined or intermingled with rags, leaves, tow, &c. The birds are perfectly fearless, breeding as freely on stunted trees situated in the densest-populated bazaars or most crowded grain-markets as on the noblest trees in the open fields. Two appears to be the normal number of eggs; but they often lay three." The same author remarks that the variety of types of coloration is countless, and that "the ground-colour is almost invariably a pale greenish or greyish white, more or less blotched, clouded, mottled, streaked, penlined, spotted, or speckled with various shades of brown and red, from a pale buffy brown to purple, and from blood-red to earth-brown. Many of the eggs are excessively handsome, having the boldest hieroglyphics blotched in blood-red on a clear white or pale-green ground. Others, again, are covered with delicate markings, as if etched on them with a crow-quill." The average size of 273 eggs, measured by Mr. Hume, was 2·19 by 1·77 inch.

ACCIPITRES.

FALCONIDÆ.

AQUILINÆ.

Genus ELANUS.

Bill weak, the tip considerably produced, margin slightly festooned. Nostrils oval, and protected by the long loral bristles. Wings very long, reaching to or beyond the tip of the tail when closed, the 2nd quill the longest, and the 1st and 3rd slightly shorter; the distance between the tips of the secondaries and those of the primaries almost equal to length of tail. Tail slightly sinuated, or even at the tip. Tarsus short and stout, covered throughout with small reticulate scales, its anterior portion feathered for more than half its length. Toes very strong and short, inner toe very slightly longer than the outer one. Claws well curved, acute, and all but the centre one rounded beneath.

ELANUS CÆRULEUS.

(THE BLACK-SHOULDERED KITE.)

Falco cœruleus, Desf. Mém. Acad. R. des Sciences, 1787, p. 503, pl. 15.

Falco vociferans, Lath. Ind. Orn. i. p. 46 (1790).

Falco melanopterus, Daud. Traité, ii. p. 152 (1800).

Elanus cæsius, Savign. Syst. Ois. d'Egypte, p. 274 (1809).

Elanus melanopterus, Leach, Zool. Misc. iii. p. 5, pl. 122 (1817); Gould, B. of Eur. i. pl. 31 (1837); Gray, Gen. B. i. p. 26 (1845); Kelaart, Prodromus, Cat. p. 115; Layard, Ann. & Mag. Nat. Hist. xii. 1853, p. 104; Jerdon, B. of Ind. i. p. 112 (1862); Layard, B. S. Afr. p. 26 (1867); Hume, Rough Notes, p. 338 (1870); Shelley, Ibis, 1871, p. 44; Holdsworth, P. Z. S. 1872, p. 415; Hume, Str. Feath. 1873, p. 21; Jerd. 'Nests and Eggs,' p. 56 (1873); Legge, Ibis, 1874, p. 10; Butler, Str. Feath. 1875, p. 449; Hume, Str. Feath. 1876, p. 462; Inglis, Str. Feath. 1877, p. 16.

Elanoides cæsius, Bonn. et Vieill. Enc. Méth. iii. p. 1206 (1823).

Buteo vociferus, Bon. et Vieill. Enc. Méth. iii. p. 1220.

Elanus minor, Bp. Consp. i. p. 22 (1850).

Elanus cœruleus, Strickl. Orn. Syn. p. 137 (1855); Shelley, B. of Egypt, p. 198 (1872); Sharpe, Cat. B. i. p. 336; Legge, Ibis, 1875, p. 279; Dresser, B. of Eur. pts. xxxv. xxxvi. (1875).

La Petite Buse criarde, Sonn. Voy. Ind. ii. p. 184 (1782).

Criard Falcon, Lath. Gen. Syn. Suppl. i. p. 38 (1787); *Black-winged Kite*, Europeans in India.

Kapasi, Hind.; *Chanwa*, Nepalese; *Adavi Ramadasu*, Tel., lit. "Jungle-Tern" (*apud* Jerdon).

Ukkussa, Sinhalese, West Province.

Adult male. Length to front of cere 11·4 to 12·0; culmen from cere 0·75; wing 10·4 to 10·8; tail 5·2 to 5·6; tarsus 1·3 to 1·4; mid toe 1·0 to 1·1; claw (straight) 0·5 to 0·6; height of bill at cere 0·35. The wings exceed the tail in old birds.

Female. Wing 10·6 to 10·9.

Iris, varying according to age from orange-red to pale scarlet or carmine; cere and base of under mandible yellow; bill black; legs and feet rich yellow, claws black.

Crown, hind neck, back, scapulars, major wing-coverts, and central tail-feathers bluish or ashy grey; forehead, a line above the supercilium, ear-coverts, entire under surface, under wing, upper edge of the same, axillaries, and under surface of tail white; lores, a short supercilium, lesser and median wing-coverts, and the winglet coal-black; quills dark ashen-grey, the shafts black, and the under surface of the primaries blackish, the three lateral tail-feathers whitish, sullied on the outer webs with grey, shafts of all the rectrices black except at the tip.

Young. After leaving the nest, the iris is hazel-brown, and the bill, cere, and legs much as in the adult; in a few months the iris pales to olive-grey.

Crown and nape brownish fulvous, paling into buff over the eyes; upper part of hind neck edged whitish; back, scapulars, and greater wing-coverts slaty brown, broadly edged with fulvous white; quills dark slate, with deep whitish tips; secondary wing-coverts only, black with pale margins; tail with the central feathers brownish slaty, the rest slaty-grey; chin, gorge, and ear-coverts white; throat, chest, and breast richly tinged with buff, paling into the pure white of the lower parts; lores and eye-streak as in the adult.

With age the forehead and chest become whitish, or, in some, pale greyish, while the back and scapulars lose their brown hue and become ashy, but the two latter parts still remain tipped with whitish; the shoulder of the wing becomes blacker before the end of the first year; but the greater coverts, the primaries, and their coverts remain tipped with white until after the next moult. It is not until the bird is fully adult, probably two years old, that the back loses entirely the brown shade, and the lateral tail-feathers their grey hue.

Distribution.—The Black-winged Kite is widely dispersed over the low country, and is a common bird throughout the Kandyan Province, more especially during the cool season (October until April), during which period it breeds in many of the hill-districts. As regards the lowlands, it is not at all uncommon in the south-eastern, eastern, and northern portions of the island, where the characteristic grass-lands, surrounded by forest, or bordering the shores of large tanks or inlets of the sea, and often, too, studded with dead trees, furnish it with a hunting-ground and many a favourite perch. In the extreme north I have seen it in the Jaffna peninsula; and Layard procured at Pt. Pedro.

In the Western Province south of the Chilaw district it is not often seen during the south-west monsoon; but in the dry season it is not uncommon, and has been procured as near Colombo as the cinnamon-gardens.

It occurs in many places in the Galle district, more particularly about citronella-grass estates and young cocoa-nut plantations. I have found it more particularly in the open lands of the delta of the Mahawelliganga and the Batticaloa district, in the low jungles and scattered scrubs between Madampe and Puttalam, and in grassy wastes surrounding the tanks near the south-east coast, than in other parts of the low country.

In the Central Province it confines itself to the open country in Uva, and the patnas and cultivated valleys interspersed with woods which are characteristic of the hills from the neighbourhood of Kandy to the base of the main range, as also to the so-called "plains" surrounded by forest in the latter district, among which I may cite Nuwara Elliya, the Kandapolla, Elk, and Elephant Plains, where it is a well known bird, particularly in the breeding-season.

The Black-winged Kite is a bird of wide geographical range, inhabiting the entire Indian peninsula, South-eastern Europe, and the whole of the continent of Africa. As regards the Indian empire, in which its range has more interest than elsewhere for my readers, it is found in the south of the peninsula, but perhaps not commonly, as it is absent from Mr. Hume's First List of Birds from the Travancore Hills, Mr. Bourdillon not having observed it there. In the Khandalla district it is rare in the vicinity of Ahmednagar; but this is a local peculiarity, for it is fairly plentiful further north. Dr. Stoliczka procured it at the Gulf of Cutch, Captain Butler says it occurs all over the plains of Northern Guzerat; and Mr. Hume records it as plentiful in Nepal, though it is rare in Sindh, which region is probably too barren for its habits. Along the base of the Himalayas it is not uncommon, Mr. Thompson having found it breeding in Lower Gurhwal and the Dehra Doon. About the Sambhur Lake Mr. Adam says it is not uncommon; and Mr. Ball found it tolerably so in the western parts of Chota Nagpur, while in the Satpura hills it was rather abundant. Bearing towards Burmah, we find that in the boundary-district of Cachar it is rare, Mr. Inglis only having seen half-a-dozen

specimens in four years; and at Thayetmyo Captain Feilden merely notes its occurrence, while Mr. Oates met with it only in the Arracan hills. In Tennasserim Mr. Hume has reason to think it occurs; and if so, this is its furthest range to the south-east. It has not been met with at the Andamans. In the Laccadives, however, it is a visitant, presumably from the west coast; and Mr. Hume procured specimens at the islands of Amini and Cardamum. Turning towards Western Asia, we find Mr. Danford observing it in Asia Minor *in winter*, and Canon Tristram recording it as a summer visitant to Palestine and haunting the thickets on the Jordan, where it is very shy—the reverse of its nature in Egypt, where it is said to be tame and easy to shoot. In South-eastern Europe it occurs as a straggler; and Lord Lilford mentions having seen a specimen killed in Southern Spain.

The example recorded in 'The Ibis,' 1872, as killed at Harristown Bay on the east coast of Ireland, was probably an escaped bird from some ship.

As regards Africa, Captain Shelley says that it is abundant in Egypt. On the Gold Coast Mr. H. T. Ussher, now Governor of Labuan, observed it in considerable numbers; it frequented there low ground sloping towards the sea, and hawked in the evening towards sunset. Mr. T. E. Buckley found it fairly common in Natal; and Mr. Barratt procured it near Rustenberg; and it is seen in most South-African collections.

Habits.—This handsome bird, frequently called the "White Hawk" in the coffee-districts, affects grass-land surrounded by forest, dry pastures interspersed with low timber, cocoa-nut estates, citronella-grass plantations, and such spots as are open and dotted here and there with large trees. The maana-grass patna teeming with life and here and there broken by strips of jungle is a favourite resort; or, in the upper hills, a tall dead tree by the border of the lonely forest-begirt "plain" forms an equally appreciated look-out. It is usually a solitary bird, and is abroad at early dawn, lazily flapping its way across the silent jungle-glade to some accustomed perch, where it will sit preening its feathers in the rays of the rising sun, and if disturbed will fly off to the nearest prominent tree, of which it invariably selects the topmost branch to rest on. In some places, however, where no doubt it is very plentiful, it forsakes its solitary habit; for Mr. Hume writes in his 'Rough Notes,' that he once saw more than a dozen pairs hunting together over the dry reedy bed of a jheel. I have usually found its diet to consist of lizards and large coleoptera; but it is said to carry off wounded birds in India. It likewise feeds on field-mice and rats; and when quartering over grass-land I have often seen it stop and hover like a Kestrel, but with a slower motion of the wings. Its usual flight is performed with a heavy flapping of the wings; and this action, combined with its short tail and white plumage, imparts to it much the appearance of a Sea-Gull. I have often admired it, showing its handsome plumage off against the dark green forests in the upper hills, as it would leisurely course round the edge of one of the open patnas, now and then stopping when its attention was arrested by something in the grass beneath it, and hovering for a minute, perhaps rapidly to descend with outstretched talons and uplifted wings, or to resume its quiet tour of observation round the forest. Concerning its economy in India Jerdon writes, "It is not very much on the wing, nor does it soar to any height, but either watches for insects from its perch on a tree or any elevated situation, or takes a short circuit over grain-fields, long grass, or thin jungle, often hovering in the air like a Kestrel, and pounces down on its prey, which is chiefly insects, but also mice and rats, and probably young or feeble birds."

In Northern Guzerat, Capt. Butler writes (*loc. cit.*), "it is generally found singly or in pairs. Its *modus volandi* is very varied. Sometimes it flies lazily along like a Gull; at other times it sails round and round in circles, often stopping to hover in the air like a Kestrel, as recorded by Dr. Jerdon. Then, again, when hunting, it flies with quite the swiftness and quite the style of a Falcon. I have seen one of these birds stoop and carry a wounded Quail with quite the rapidity and dash of a Peregrine." Concerning this Kite's note, although it is generally a very silent bird (I have never heard its voice, though I have seen it dozens of times), it is said sometimes to utter loud screams. So far back as 1782, Sonnerat, who met with it in his voyages to India, named it the "Petite Buse criarde," doubtless on account of the loud notes it uttered; and Mr. F. A. Barratt writes, in his "Notes on the Birds of the Lydenburg district," South Africa, of one which he shot:—"It attracted my attention by a harsh cry, high in the air, which I thought to be that of an Eagle; but, to my surprise, I found it proceeded from this bird."

The Black-winged Kite appears to thrive in confinement. Mr. W. Murray, of the Ceylon Civil Service,

kept a young bird, which he took from a nest at Nuwara Elliya, for some time. It partook greedily of meat; and I noticed that it perched with the outer toe reversed. The iris of this bird took two months to change from dark brown to light hazel.

Nidification.—This species breeds from December until March, and, I have reason to believe, resorts in considerable numbers to the hills during its nesting-season. I have known it to build both near and in Nuwara Elliya, in Deltota, and in Kadugunawa, in which latter place I took its nest myself in December 1876. This nest was built in a moderately tall, umbrageous tree, in an exposed situation on one of the patnas of the Kirimattie estate, and within a few hundred yards of the bungalow. It was placed among the topmost leafy branches, supported by a fork so slender that the small boy I sent up had great difficulty in reaching it. It was a very openly constructed fabric, about the size of a common Indian Crow's nest, made of small sticks laid over one another so far apart that daylight could be seen anywhere through it except just in the centre. The interior was flat, and formed of small twigs, on which lay the two eggs. One of these was almost a perfect, and the other a broadish oval, of a dull white ground-colour, in one stippled all over with reddish-brown dots and encircled just beyond the centre with a ring or zone of the same, in the other blotched openly throughout with smeary markings of brownish red, confluent round the smaller end, and mingled in other parts with lighter patches of reddish brown. They measured respectively 1·54 and 1·61 inch in length by 1·23 and 1·17 inch in breadth. The female bird was frightened from the nest by our approach, and flew off with the male, not returning until after we had left with the eggs, and then only to fly heavily round the tree, and make off again to a neighbouring wood.

The nest from which Mr. Murray procured his young bird was situated in the compound of the Agent's house at Nuwara Elliya, and built in the top of an Australian lightwood (*Acacia melanoxylon*). It contained two young. Conflicting descriptions have been given of the eggs of this Kite by various naturalists; and a *résumé* of the information possessed concerning its nidification up to date will be found in 'Stray Feathers,' 1873, as above quoted. So many nests have, however, now been taken and thoroughly identified that the eggs have been satisfactorily proved not to vary more than those of other Hawks. Messrs. Blewitt and Adam in India, and likewise Captain Shelley in Egypt, found the number to vary from three to four; and most of the eggs found by these gentlemen seem to have been more heavily and darkly blotched than mine. From Mr. Adam's account, quoted by Mr. Hume in 'Nests and Eggs,' it appears that the nest is built in less than a week, which is a short time for a hawk to construct its nest in. After writing of the discovery of a nest near the Sambhur Lake in July 1872, he says:—"On the 7th of August I sent a man to see if the nest contained eggs; but he found that it had been abandoned and a new nest commenced in one of a group of six Lasora trees (*Cordia myxa*), which stood near to the Khajur tree. He also informed me he had seen the birds together. I inspected the nest on the 10th of August, and found one of the birds sitting on it. The nest was so loosely constructed that with my binocular I could see that it contained no eggs. I again inspected the nest on the 14th August, and found that it contained two eggs. One of the birds sat close on the nest, and could not be frightened off by a man beating on the trunk of the tree with a stick; and this same bird made a swoop at my servant as he was climbing the tree. The nest was situated on the very top of the Lasora tree, and was from 25 to 30 feet from the ground. In shape it was circular; and, with the exception of two or three pieces of Sarpat grass (*Saccharum sara*), there was no attempt at lining. It was about 10 inches in diameter; and the egg-cavity had a depression of about 2 inches." Of the eggs he writes, they "are without gloss; both have a light creamy-white ground, of which, however, little is shown. One had the broad end all blotched over with confluent patches of deep rusty red, while the smaller had numerous spots of a much lighter brownish-red." Captain Shelley, who found these nests at different times in Egypt containing each four eggs, says that in that country the nest is carefully constructed of sticks and reeds, and is smoothly lined with dry leaves of the sugar-cane.

ACCIPITRES.

FALCONIDÆ.

AQUILINÆ.

Genus PERNIS.

Bill long, rather weak, curved from the base, the tip not much hooked, wide at the base, the sides slanting from the culmen to the margin, which is not festooned; cere much advanced and bare. Nostrils linear, oblique, overlapped by the membrane of the cere. *Lores feathered like the forehead.* Wings moderately long, pointed; the 3rd and 4th quills subequal and longest. Tail rather long, broad, even at the tip. Tarsus stout, shorter than the middle toe, the upper half plumed in front, and the remainder covered with small reticulate scales. Toes protected above with narrow bony transverse scales; lateral toes rather long and subequal. Claws acute, rather straight, trenchant beneath. Tibial plumes reaching down to the foot. Head usually furnished with an occipital and somewhat scanty crest. Eyes placed in the head posterior to the gape.

PERNIS PTILONORHYNCHUS.

(THE INDIAN HONEY-BUZZARD.)

Falco ptilorhynchus, Temm. Pl. Col. i. pl. 44 (1823).

Pernis ptilonorhynchus, Steph. Gen. Zool. xiii. pl. 35 (1826); Holdsworth, P. Z. S. 1872, p. 414; Sharpe, Cat. Birds, i. p. 347 (1874); Ball, Str. Feath. 1874, p. 381; Hume, Nests and Eggs, p. 56 (1874); Legge, Str. Feath. 1875, p. 364; Butler, ibid. p. 448; Tweeddale, Ibis, 1877, p. 286.

Pernis cristata, Cuv. Règn. An. i. p. 335 (1829); Blyth, Cat. B. Mus. A. S. B. p. 18, no. 82 (1849); Horsf. and Moore, Cat. B. Mus. E.I. Co. no. 74, p. 63 (1854); Jerd. B. of Ind. i. p. 108 (1862); Wall, Ibis, 1868, p. 17; Hume, Rough Notes, ii. p. 330 (1870).

Pernis torquata, Less. Traité, p. 76 (1831).

Pernis ruficollis, Less. *l. c.* p. 77 (1831).

Pernis albigularis, Less. *l. c.* p. 77 (1831).

Pernis apivorus, Temm. and Schl. Faun. Jap. Aves, p. 24 (1850).

The Crested Honey-Buzzard of some authors.

Madhava, Nepalese, from *madhu* (honey); *Shahutela*, Hind., from *shahud* (honey); *Tenngedda*, Tel.; *Ten Prandu*, Tam.; *Jutalu*, Yerklees; *Malsuwari* of the Mharis (Jerdon).

Rajaliya, Sinhalese.

Adult male. Length to front of cere 23·5 to 24·5 inches; culmen from cere 1·0; wing 15·5 to 15·8; tail 9·0 to 10·3; tarsus 1·9 to 2·0; middle toe 1·9 to 2·1, its claw (straight) 0·95; height of bill at cere 0·38 to 0·4.

Female. Length to front of cere 24·5 to 25·5 inches; culmen from cere 1·0 to 1·1; wing 15·7 to 17·9; tail 10·0 to 11·5; tarsus 1·9 to 2·1; middle toe 1·9 to 2·2, its claw (straight) 1·0 to 1·02; height of bill at cere 0·48. Expanse of an example with a wing of 16·5, 55·0.

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The above dimensions of males are taken from four specimens, and those of females from twelve, of Ceylon-killed birds. It is the exception to find a female measuring in the wing more than 17·0 inches. Four in my own collection measure as follows—15·7, 16·5, 16·5, 16·6: eight others, five of which are in the Norwich Museum, and two in Lord Tweeddale's collection, 15·7, 16·8, 16·7, 16·4, 17·5, 16·6, 17·9, 16·4. The last but one is included in a list my friend Mr. Gurney sent me, of two or three birds in Lord Tweeddale's collection, measured by himself, and is most exceptional if the measurement is correct, which I have no doubt it is. The specimen must be an extraordinary and quite abnormal one—a giant among the Ceylonese Honey-Buzzards! I may remark that Mr. Gurney sends me the wing-measurement of a male in the same collection as 17·78. I take it for granted that this specimen has been wrongly sexed by the collector.

Iris golden yellow, yellow mottled with brown, or yellow with a pale outer circle; cere deep leaden colour; bill blackish, gape and the base of under mandible bluish; legs and feet dull yellow, in some citron-yellow. The iris being very variable, I have enumerated the several colours which I have found in dark birds. It is never *red* as in the North-Bengal race.

Fully adult or very old stage. Crown, hind neck, and upper surface rich dark earth-brown, the tips of the hindneck-feathers often darker than the rest; back and wing-coverts suffused with a purplish lustre, a short occipital crest of 4 or 5 stiffish ovate feathers attaining a length of 2·3 inches, sometimes black, and at others concolorous with the nape; the forehead above the eye, entire face, ear-coverts, and throat iron-grey, blending into the surrounding plumage; quills ashy brown, crossed with three or four widely separated bars of dark purplish brown, and a broad terminal band of the same, the extreme tip pale, the inner webs whitish from the notch inwards, with the interspaces mottled with brownish; upper tail-coverts, in some examples, tipped with whitish; tail dark purple brown, crossed by a broad, 2-inch, smoky-grey band about the same distance from the tip, and in some with a narrow bar of the same near the base.

Throat and entire under surface dark chocolate-brown, the feathers dark-shafted; a dark stripe on each side of the throat, frequently continued across the fore neck in the shape of a gorget; under wing-coverts at times tipped with fulvous; under surface of light portion of tail grey. In two very dark specimens I examined in Kandy the feathers of the lower breast and abdomen were pale-tipped.

A younger stage of plumage, but one which represents the generality of apparently adult birds killed in Ceylon, is as follows:—

Above rich sepia brown, the margins of the feathers somewhat paler, and the feathers of the occiput and hind neck, as well as the fore neck and entire hinder surface, a fine chestnut brown, with blackish shafts; a well-developed crest of black feathers; the lores and round the eye, in some examples, dark iron-grey mingled with brown, while in others the forehead and above the eye is whitish, the centres of the feathers being concolorous with the crown; the dark moustachial stripe is present, and, in the darker examples, is black, spreading over the throat and sometimes running up in a point to the chin; the median wing-coverts are usually light-tipped, and have a considerable amount of white at the base of the feathers; the quills are not so dark as in the above, and have more white at the tips, the bars being also closer together, and the interspaces more or less crossed with wavy light rays; in the tail, the lighter or earthy-brown hue is the ground-colour, and contains numerous pale wavy cross rays; the tip is whitish, and adjacent to it is a broadish deep-brown bar; about 2¼ inches above this, across the centre of the feathers, is a narrow bar of the same, and another similar one near the base. The under surface is variable, being in some examples a light fulvous brown, with the stripes very broad; while in others the striæ are almost wanting on the breast; the colour of the whole breast, however, is more or less uniform and devoid of white spaces in the younger bird; most of the basal portion of the inner webs of the primaries is white.

In this stage the tail wants the characteristics of the very old bird, viz. the smoky-grey nearly uniform bands; but the lores and the space beneath the eye have the grey appearance, which is a marked adult sign. The presence of the white forehead in this adult stage, I consider to be quite abnormal, as many younger birds (as will be presently noticed) have it uniform with the head.

Young. In birds of the first year the wing varies from 15·6 to 16·0, the other parts equal those of the adult.

Iris in some yellow, in others brownish yellow, sometimes with a dark inner edge; cere bluish with greenish patches, in others greenish yellow; legs and feet greener than in the adult.

Back, scapulars, and wing-coverts darkish hair-brown, the wing-coverts more or less pale-edged, the median series being the lightest, some examples having the lesser rows edged with whitish, and the outer series of primary-coverts broadly margined with the same; crown and occiput rich tawny brown, the feathers with blackish shaft-stripes; the hind neck with the larger part of the feather whitish, and the terminal portion pale brown with a dark shaft-stripe; the crest-feathers blackish brown, broadly margined or tipped with white; forehead and a broad space above the eye white; lores and a broad posterior orbital streak dark brown with a slightly greyish shade, inner primaries and secondaries deeply tipped with white, pale brown on both webs, and barred with dark brown, longer primaries with more of the inner webs white than in adults, and with the basal portion of the outer webs light

brown, crossed with dark bars alternating with the interspaces of the inner webs; tail smoky brown, deeply tipped with white, and crossed with four narrow and rather irregular bars of dark sepia-brown, the subterminal one not much broader than the others, and the light portions crossed with wavy light rays; throat and entire under surface, with the under wing and the edge above the metacarpal joint, pure unmarked white; ear-coverts pale brownish.

From this stage the first advance towards adult plumage is made (probably after the first moult) by the head, hind neck, and upper surface generally becoming more uniformly dark, although there is usually still a good deal of white about the hind neck; the dark lores and space behind the eye extend, and the cheeks and face become striated with dark brown, and a series of streaks from the gape down each side of the throat appear as the first signs of the future dark stripe; the bars on the tail, especially the subterminal one, become broader; the chest and breast assume blackish-brown stripes, more or less broad, on the white ground, while the lower breast, flanks, and abdomen become, in some examples, barred with brown, and in others washed over the whole feather with the same, the flanks and thigh-coverts generally being the darkest. In this stage, I believe, a considerable advance in the plumage is made by a change in the feather itself; and hence the great variety in the birds at this age. The dark grey hue of the lores spreads over the cheeks; the ear-coverts and forehead become nearly concolorous with the crown; the broad lateral throat-stripes of black develop and spread across the fore neck, the chin and gorge becoming brownish; at the same time the bars on the lower parts of those examples having the barred feature spread over the feather, or the brown of the flanks in the other type encroaches gradually on the breast.

Obs. Mr. Gurney has noticed that Ceylonese specimens of this Honey-Buzzard are larger than those from India. As will be seen, the above list contains some very high wing-measurements; but if an extensive series of Indian birds be examined, I have no doubt some will be found equally large. Mr. Hume gives the largest wing, in six females measured, as 17·25, and Mr. Sharpe, in his Catalogue, the average of a large series as 16·5. Some I have measured in the British Museum are as follows—(Deccan) 16·2, (Nepaul) 16·2, (N. Bengal) 17·4, (Kamptee) 16·3, (Himalayas) 17·1, (Darjiling) 15·9. All our largest specimens have been shot in the hills of Ceylon; and, as I demonstrate below that the species is for the most part migratory to Ceylon, these large birds must be not inferior to their fellows elsewhere, or they must be bred on the hills of the island. Mr. Sharpe has measured an example from Java with the wing 17·8, which favours the idea that Ceylonese birds may migrate from that quarter, although it must be remarked that Javan birds have longer crests than ours. Much has been said about the irregular plumage of the Honey-Buzzards; but if a series of examples of different ages be examined, a regular gradation in the plumage, from the pale-chested bird up to the one with the grey face (which is an unmistakable sign of age) and the dark under surface, can be noticed. The fact of white-chested birds breeding with dark ones can be easily explained by assuming that there is in the Honey-Buzzard, as in some Eagles, a permanent light phase.

Distribution.—The Honey-Buzzard is to a certain extent a migratory bird to Ceylon, and appears, from what I observed while in the island, to make its appearance first of all on the north and north-east coasts, which leads to the inference that it migrates with the north-east monsoon from Burmah, or perhaps from the southern part of the Indian peninsula, to Ceylon. It used to appear yearly on the coast about Trincomalie during November and December, and then depart into the interior. In 1874 I obtained two newly arrived and very tame examples in the Fort, which is a point of call for many migrants arriving with the north-east wind on that part of the coast. Several other birds haunted the vicinity of the town at the same time; in the following year, however, scarcely an example was to be seen, although it was comparatively numerous in the Kandy district. It was first recorded as a Ceylonese bird by Mr. Holdsworth (*loc. cit.*), from an adult female shot by Mr. Forbes Laurie in the Madoolkella district, not far from Kandy. It had prior to this been received from Ceylon, but its occurrence omitted to be noticed in print. It locates itself in the northern forests, preferring the vicinity of the tanks which abound in that part; and many birds remain there yearly, and doubtless breed in those unfrequented haunts. I have seen it in such places during the south-west monsoon, and have likewise received specimens from Avisawela and Kurunegala, in the western part of the island, at the same season of the year. I have shot it in August in the Park country, where it is not uncommon; and I have no doubt it inhabits the forests between Badulla and Hambantota. In the south-west I have never known it to occur. As regards the mountain-region, it is principally found about Dumbara and other places of intermediate altitude in the direction of Kandy. Occasionally, however, it ascends much above this; for Mr. Bligh has shot it in Dimbula. It is possible that some of the birds occurring on the hills have been bred there, as they appear to be larger than those which are evidently migrants.

One of the most interesting points yet to be decided with reference to Ceylon ornithology is that relating to the movements of this fine bird. Whether it comes from Burmah or from South India, or even from Sumatra, remains yet to be seen. If an extensive series could be obtained from South India, a comparison of it with another from Ceylon would easily settle the matter with reference to that quarter.

This species is scattered throughout India, extending into Burmah and a portion of the Asiatic archipelago. It is not unfrequent in the south of India, but appears to be local in its distribution there. Jerdon says of it, in the 'Madras Journal:'—"I have only met with this bird in the jungles of the western coast and Nilghiris. It is by no means common. . . . . I procured a female at the foot of the Conoor pass, and another on the summit of the hills." Mr. Bourdillon appears not to have found it in the Travancore district. Near Khandala and in the western parts of the Deccan it is common; in the region about Mount Aboo and in Northern Guzerat Captain Butler states that it occurs, but not commonly; and at Sambhur it appears now and then as a straggler. Mr. Hume does not record it from Sindh. In the North-west Provinces it occurs; and in Chota Nagpur Mr. Ball has procured it; but it is found in that district sparingly, though this gentleman says that it appears to be common near the Ganges at the north-east corner of the Rajmehal hills; this, however, has reference to the red-eyed race, which is spread through Bengal, and which some think is specifically distinct from the southern bird. The Pegu race, likewise, Mr. Hume considers differerent from the Bengal on account of its smaller size; it appears to be not uncommon there. From Tenasserim I do not find that it has as yet been received; and it has not yet been discovered in the islands of the Bay of Bengal. From Java it is well known; and of late it has been procured by Mr. Buxton in South-east Sumatra, having been also previously known from the island of Banka.

Habits.—Well-wooded districts and large tracts of jungle are the favourite habitat of this handsome bird. It is solitary in its habits, and is partial to the vicinity of water. I have more than once surprised it in shady trees on the borders of forest-rivers or lonely tanks, when it would make off with a straight quick flight to another inviting perch. I have also seen it perched on the tops of high trees in forests, when it much resembles the Serpent-Eagle in the distance. It soars high in the air at times, taking short circles as it ascends, and, according to some observers, has the habit of descending with a rush, much to the terror of the small birds in the neighbourhood. This I have not seen myself, though I have witnessed it soaring at a considerable height. Jerdon observed it attempting to hover, which he said it did in a clumsy manner. Its usual diet consists of honey, which it robs in spite of the attacks of the inmates of the nest, against whose stings, however, its peculiarly-feathered face and lores well protect it. With the honey it also devours the young ones, remains of which I have invariably found in its stomach. It is said also to eat other insects, white ants, and small reptiles; but the latter food, I imagine, is only resorted to when pressed for want of its usual diet. One that was shot in the Fort at Trincomalie was associating with Crows, and flying round the barrack-room at the dinner-hour in company with them, on the look-out for scraps thrown out from the verandahs. Another haunted the fine trees shading the officers' quarters for more than a day, and appeared not to mind the frequent passers-by in the least, finally allowing me to shoot it in the tamest manner.

Its habits do not appear to have been paid much attention to by Indian observers, Jerdon being the only one who has recorded much concerning it. He writes in the 'Madras Journal:'—"I occasionally saw it seated on a tree, alternately raising and depressing its crest, and in the Nilghiris frequently noticed it questing diligently backwards and forwards over the dense woods there. . . . . Their usual flight is rather slow; but I once observed one flying more rapidly than in general, with a continued motion of its wings, and every now and then attempting to hover, with its wings turned very obliquely upwards." He further remarks in the 'Birds of India,' that Burgess mentions his having been told by some natives that, when about to feed on a comb, it spreads its tail and with it drives off the bees before attacking it.

Nidification.—The Honey-Buzzard may possibly breed in the central and northern forests of Ceylon; but I know of no evidence to this effect. In India it breeds from April until July, nesting in the forks of trees. It builds a nest of sticks and small twigs, and lines the interior with green leaves or fresh grass—a common habit with raptorial birds. Captain G. Marshall observes that the female sits very close during the period of incubation, and is not easily driven away from its nest. This is unusual with the Hawk tribe, the

majority of which leave their nests when they are approached. The eggs are two in number as a rule; but some nests have been found only to contain one. They are round in shape, of a "whitish pinkish-white or buffy-yellow" ground-colour, and vary much in the character of their markings, although they are usually very highly coloured with blotches and clouds of reddish or purplish brown and dark red, sometimes quite confluent round one end. They average 2·03 inches in length by 1·72 in breadth.

Subfam. FALCONINÆ.

"Outer toe only connected to the middle toe by interdigital membrane; tibia much longer than tarsus, but the latter not contained twice in the former; hinder aspect of tarsus reticulate; bill distinctly toothed." (*Sharpe*, Cat. Birds, i. p. 350.)

ACCIPITRES.

FALCONIDÆ.

FALCONINÆ.

Genus BAZA.

Bill stout, curved rapidly from the base of the cere; tip much hooked, and notched with a double tooth; cere but slightly advanced. Nostrils linear, oblique, covered as in *Pernis* by the superlying membrane. Wings moderate, rounded, with the 4th quill the longest, and the 1st subequal to the secondaries. Tail moderately long, much exceeding the closed wings. Tarsus short, the front and sides plumed for more than half its length; the remainder covered throughout with reticulate scales. Middle toe subequal to the tarsus; lateral toes nearly equal; the whole covered with bony transverse scales. Claws rather straight, the inner less than the middle.

Head with an elongated occipital crest.

BAZA CEYLONENSIS.

(THE CEYLONESE CRESTED FALCON.)

(Peculiar to Ceylon?)

Baza ceylonensis, Legge, Str. Feath. 1876, vol. iv. p. 202; Whyte, ibid. 1877, p. 202.

Similis *B. magnirostri* sed cristâ nigrâ latè albo terminatâ, secundariis latè albo terminaliter marginatis: rectricibus 4-fasciatis, plagâ subterminaliter minore quam fascia apicalis brunnea: subtùs fulvescenti-brunneo nec rufescenti transfasciata: gutture fulvescenti nec cinereo lavato.

Adult. The following are the measurements of the two type specimens described by me *loc. cit.*, the larger of which is presumed to be a female:—Length to front of cere (from skin) 16·5 and 16·8; culmen from cere 1·01 and 1·03; wing 11·7 and 12·0; tail 7·5 and 8·0; tarsus 1·5 and 1·5; middle toe 1·35 and 1·45; claw (straight) 0·65 and 0·68; height of bill at cere 0·4 and 0·5; tarsus feathered to 0·5 from the root of the middle toe.

Iris yellow; bill blackish leaden, lower mandible pale at base; cere (judging from the skin) dusky plumbeous; legs and feet yellow; claws plumbeous, pale at base.

Male. Back, scapulars, lesser wing-coverts, and centres of the feathers on the hind neck and head deep brown, paling on the rump slightly, and with a strong purple sheen on the mantle as well as on the under-mentioned caudal bars; the feathers of the back with perceptibly pale edgings, those of the head and hind neck broadly margined with pale tawny, the superciliary region being entirely of this colour, the forehead slightly darker with the shafts of the feathers blackish; crest 1¾ inch in length, black, conspicuously tipped with white; greater secondary-coverts and tertials paler brown than the scapulars, many of the feathers tipped whitish, primaries and secondaries smoky brown, the latter and the inner primaries deeply tipped with white, and the whole crossed with blackish bars, the ulterior one being terminal, inner edges of the primaries white on the lighter portion of the feather; tail drab-brown, pale-tipped, a broad subterminal band of purplish black, and three narrower of the same, the basal one hidden beneath the coverts.

Lores and a stripe behind the eye blackish brown; cheeks and ear-coverts slate-grey, with dark shafts; chin and throat buff, the feathers down the centre with blackish shaft-stripes; chest and sides of the fore-neck almost uniform tawny cinereous, under surface from the chest, with the under wing-coverts and lower surface of the basal portion

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BAZA CEYLONENSIS.

of quills, white, barred on the breast and flanks with rufescent brown bands equal to the white interspaces, narower and further apart on the tibial plumes, and almost absent on the under tail-coverts; inner sides of legs buff-white: lesser under coverts crossed with narrow rufous markings, major series with a few transverse brownish patches; lower surface of light portions of tail greyish white.

Presumed female. Has the upper surface generally somewhat paler; but the crown is darker, the blackish central stripes being broader than in the above example; crest consisting of four long feathers 2 inches long; the primaries and secondaries, which are just acquired after moult, very deeply tipped with white; the chest differs in its less uniform hue, having the feathers with broad rufous centres and widely margined with buff-whitish; the under surface is similarly barred, under tail-coverts and wing-lining the same.

Young. The example referred to below as presented by Mr. S. Bligh to the Norwich Museum is a young bird. The posterior tooth is not developed, and the anterior less deep than in the adult.

Its length (from the skin) is 17·0 inches; wing 12·25; tail 8·0; tarsus 1·15.

Above glossy dark brown, the feathers of the back, scapulars, and wing-coverts edged with whitish; centres of the head- and hindneck-feathers brown, with broad margins of fulvous white; crest black, deeply tipped with white, and 1·8 inch in length; primaries and secondaries smoky brown, with blackish bars and white inner edges to the basal portions of the former, similar to the adult; median and greater secondary wing-coverts deeply tipped with white, adjacent to which the brown hue changes into rufous, giving the wing-coverts a rufescent appearance; tail smoky brown, banded with five brown bars narrower than in the adult; under surface white; a very fine chin-stripe of brown, formed by dark shaft-lines on one or two feathers; chest marked with well-defined brown stripes; breast and flanks widely barred with broad pale sienna-brown bars.

Another immature example, in the British Museum, from the collection of Messrs. Whyte and Co., and which is a female, is very similar to the above, but may perhaps be a little older: wing 12·1, tail 7·8, culmen from cere 1·01. The posterior tooth slightly developed, but not so prominent as the anterior.

Iris yellow; feet and tarsi yellowish; head and hind neck fulvous tawny, with dark central stripes increasing in width at the lower part of the neck; the crest black, deeply tipped with white, and 2·0 inches in length; the back and wings are deep brown with a purplish lustre, the feathers margined with rufous brown; greater wing-coverts barred with pale brown; the barring of the quills is the same, and the inner part of the lighter interspaces on the inner web white; tail as above, the tip whitish, and the subterminal dark bar equal in width to the adjacent interspace; lores blackish brown; cheeks and ear-coverts with tawny-brown striæ; throat and under surface buff-white; the chin with a pale brown mesial stripe, widening and darkening on the throat; chest marked with broad "drops" of rufous-chestnut, changing on the breast, flanks, abdomen, and shorter under tail-coverts into bars of the same; longer under tail-coverts unmarked; thighs crossed with bar-like spots of rufous.

A third immature specimen has been sent home to the Norwich Museum by Messrs. Whyte and Co., since this article was written. Mr. Gurney writes me that it measured, as he was informed, 18·5 inches in the flesh, and weighed 1 lb. The wing, according to his system of measuring, is 12·5 inches (which would be equal, after my plan, to 12·2 or 12·3), tail 8·5, tarsus 1·5, crest 2·3.

It is older than the specimen presented by Mr. Bligh, "having much less of the white margins to the feathers on the upper surface, and the throat and breast being decidedly more fulvous; the tail has 4 bars instead of 5." This latter feature testifies to its age; and I think its plumage may be taken as representing an intermediate stage between the young and the old bird.

Obs. I do not consider this a very good species. It comes very close to *B. magnirostris* from the Philippines; but as this latter has such a remote habitat, I have allowed the slight differences that exist to weigh in favour of keeping the Ceylonese bird distinct for the present. The adult type of *B. magnirostris* is a smaller bird than *B. ceylonensis*: it has the wing 11·1 inches, tail 7·2, tarsus 1·3. The crest is not deeply tipped with white as in the latter, but has the terminal portion of the webs laterally edged with it only; the secondaries and primaries are not deeply tipped with white; and the tail-bands are narrower and five in number; the cheeks are much paler, and the chin-stripe *inconspicuous* and of a light iron-grey colour uniform with the cheeks; the chest is very similar, but the breast- and flank-bands are more rufous than in my bird. This latter characteristic, however, is not to be depended upon. *B. ceylonensis* likewise has a considerable general resemblance to the example in the British Museum, which Mr. Sharpe considers now to be *B. jerdoni*; but this has the head very dark indeed, and is rufous on the cheeks and sides of the head. Mr. Hume's species, *B. incognita* (Str. Feath. 1875, pp. 314–316), from Sikhim and Tenasserim appears to be more closely allied to this species than to the Ceylonese bird, being considerably larger (wing, ♂ 13·12, ♀ 13·75) than the latter; and the specimens described seem, moreover, to be immature.

If identical with any other member of the genus, one would naturally seek to join my bird to *B. sumatrensis*, which has a comparatively adjacent habitat, to it. I have, however, compared this, in company with Messrs. Sharpe and Gurney, with two of the immature examples of the Ceylonese form; and these gentlemen concur with me that the

Sumatran bird, as far as can be proved by the evidence of the single immature example which exists of it, is distinct. The testimony of an immature bird, it must be allowed, is not a very safe one to go upon; but nevertheless, as the specimen exists, it is a larger bird (wing 12·75, tail, very long, 9·6), has no chin-stripe, which is a marked characteristic of *B. ceylonensis*, has the under-surface bars much broader and of a different appearance, and the tippings of the back and scapular feathers fulvous and not white. Unless, therefore, *B. magnirostris* from the Philippines turns out some day to be identical with *sumatrensis* from Sumatra, and both the same as *ceylonensis*, I think the latter species may hold its own, as it can scarcely be one with the Philippine bird, a species not hitherto procured to the westward of those distant islands. As yet every member of the genus (except the curious *Baza lophotes*, totally unlike any other in its plumage) has proved very local in its habitat; and were it not for this fact, it would be difficult to imagine our bird restricted to so small an island as Ceylon *.

Distribution and Discovery.—This interesting Crested Falcon was described by me (*loc. cit.*) from two adult examples which I found in the collection of Messrs. Whyte and Co., naturalists, in Kandy, in August 1876. They were both shot on the same day, the 6th of the same month, by Mr. F. H. Davidson, of Matale, on the Kudupolella estate. In May of the same year, however, I had met with an immature specimen (the one now in the Norwich Museum) at Mr. Bligh's bungalow, and identified it from Mr. Sharpe's plate in the 'Catalogue of Birds,' vol. i., as *B. sumatrensis*. This example was therefore the first that came under my notice; it was shot in the early part of 1875 by a Mr. Colville, near Nilambe, in the Kandy district, and preserved in Messrs. Whyte and Co.'s establishment. In the beginning of last year the immature bird referred to above as now in the National collection, was procured near Kandy by Messrs. Whyte and Co.'s collectors; and a third example has been lately sent by this firm to the Norwich Museum, a female, and shot in the Central Province on the 3rd of January last. Since the publication of my account of the species, Mr. A. Whyte has stated, in a paper which appeared in 'Stray Feathers,' August 1877, that the "bird was *discovered* † by us *eight years ago*, a pair having been shot by one of our collectors not far from Kandy." With regard to this pair Mr. Whyte writes to me lately as follows:—"They were shot on the same day, from the top of Oodoowella crag, about four miles from Kandy, by a Singalese collector, Carolis, in the fall of 1870; since then at least ten specimens of the bird have passed through our hands; and I can quote Kandy, Matale, Rattota, and Deltota as among the situations in which it has been found." It would appear, therefore, that it has only been procured within the very limited district stretching from Matale 10 miles north of Kandy, to Deltota, about 12 miles, in a direct line, to the south of the town. This part of the hill-region of Ceylon, it should be remarked, is that in which most of the birds are shot that are sent to Messrs. Whyte and Co.'s for preservation, inasmuch as they can be forwarded by Coolie runners, and skinned before suffering from the decomposing effects of tropical heat; it is not, therefore, to be inferred that the habitat of the Ceylon *Baza* is restricted to such a very small tract of country as this, but rather that it is a hill-bird scattered throughout the

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* I have just heard, since correcting the proof of this article, from Mr. Hume, that he has lately received a young specimen of a *Baza* from the Wynaad, which he considers must be identical with this species. Mr. Hume has not, as far as I am aware, seen examples of *B. ceylonensis*; but his surmise may be correct. I accordingly put it doubtfully "peculiar to Ceylon."

† In the interests of Ceylon ornithology I am constrained to make some remarks on Mr. Whyte's note on this species. Were it not my aim to give a faithful history of all the peculiar Ceylonese forms, I should not have referred to the subject. It is difficult to see in what sense the writer uses the word "discovered." The species was in reality discovered by the collector who shot it; for the specimens were afterwards skinned, sold unidentified, and lost for ever to science! In continuation of the above paragraph, follows:—"Three more specimens have been *collected by us*, one of which Captain Legge obtained from us." Two of these I will remark are comprised in the pair *shot by Mr. Davidson* and sent to Messrs. Whyte and Co.'s for preservation, one of which Mr. Whyte sold me under the impression that it was a Crested Goshawk (a not unlikely mistake for one who had formed no acquaintance with the genus *Baza*); and the other he sent me on the order of Mr. Fraser, of Colombo, a friend of Mr. Davidson, and who kindly presented it to me. The words *collected by us*, in reference to this pair are therefore misapplied. When I wrote to Mr. Whyte, shortly after the purchase of the type specimen, that it was a new *Baza*, I much wish that he had informed me of his having previously received a pair. I could then have made inquiries concerning the birds, and should perhaps have succeeded in tracing them to their destination; in which case I could have verified Mr. Whyte's identification.

Central-Province subranges, although it has not yet been recorded beyond the vicinity of the Kandyan capital.

Habits.—I am unable to furnish any information concerning the habits of this species, beyond that I learn it frequents the borders of forests, the vicinity of steep-wooded hill-faces and patnas interspersed with jungle. When killed it has doubtless been met with in such localities; but as a rule it will be found, like its congeners, to be a forest-loving species, like *Baza lophotes* and *B. reinwardti.*

The front figure in the Plate accompanying this article is the adult male bird killed at Matale, and that in the background the young bird sent home by Messrs. Whyte and Co. to the British Museum.

BAZA LOPHOTES.

(THE INDIAN CRESTED FALCON.)

Falco lophotes, Temm. Pl. Col. i. pl. 10 (1823).
Buteo cristatus, Bonn. et Vieill. Enc. Méth. iii. p. 1220 (1823).
Baza syama, Hodgs. J. A. S. B. v. p. 777 (1836).
Baza lophotes, Gray, List Gen. B. p. 4 (1840); Blyth, Cat. B. Mus. A. S. B. p. 17 (1849); id. J. A. S. B. xix. p. 325 (1850); Kelaart, Prodromus, p. 115 (1852); Layard, Ann. & Mag. N. H. 1853, xii. p. 102; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 62. no. 72 (1854); Jerd. B. of Ind. i. p. 111 (1862); Hume, Rough Notes, ii. p. 337 (1870); Holdsworth, P. Z. S. 1872, p. 415; Sharpe, Cat. B. i. p. 352 (1874); Walden, Ibis, 1876, p. 341.
Hytiopus syama, Hodgs. J. A. S. B. x. p. 27 (1841).
Hytiopus lophotes, Blyth, J. A. S. B. xii. p. 312 (1843).
Pernis lophotes, Kaup, Contr. Orn. 1850, p. 77.
Baza indicus, Bp. Rev. et Mag. de Zool. 1854, p. 535.
Cohy Falcon, Lath. Gen. Hist. i. p. 165, pl. x. (1821).
Black-crested Kite, "*Baza*," *Cohy Falcon*, *Cohy Pern*, in India.
Cohy of the Parbutties; *Syama*, lit. "Black," Nepal.

*Adult male**. Length to front of cere 12·5 inches; culmen from cere 0·8; wing 9·2 to 9·4, expanse 30·5; tail 5·0 to 5·5; tarsus 1·05 to 1·1; middle toe 1·0 to 1·1, claw (straight) 0·47; height of bill at cere 0·35.

No difference in size exists between examples from Nepaul, Ceylon, and Pinang.

Iris brownish red; cere bluish leaden; bill pale bluish leaden, darker at the sides above the tooth; legs and feet pale bluish, claws black.

Entire head, throat, body above, wing-coverts, longer scapulars, quills, tail, and body beneath from the upper breast black, with a dark green gloss above and on the under tail-coverts. A long occipital crest of 3 or 4 narrow feathers $2\frac{1}{2}$ inches in length; tertials and some of the concealed scapulars rufous towards the tips; a broad edging of the same near the extremities of the secondaries; tertials and scapulars white across the middle, showing conspicuously on the longer feathers, the terminal portions of which are black.

Chest pure white, succeeded by a band of deep vinous chestnut, many of the feathers of which are edged with black; below this the black sides of the breast are overlaid with long ochraceous white plumes, meeting across the body below the band, and barred down the sides with the chestnut; lower surface of quills and tail stone-grey, with a dark patch near the tips on the outer portion of the latter.

The black plumage underlying the stiff breast-plumes is a singular character in this bird's attire.

Young. In the bird of the year the anterior tooth is less developed than in the adult, and the second or posterior notch is *not developed*; the crest is of much the same length as in the old bird.

The chief characteristic is the great amount of white and rufous, handsomely intermingled, on the wings and scapulars.

Head and upper surface dusky black, with a rufescent tinge on the back-feathers everywhere but at the tips; the scapulars and tertials are vinaceous rufous, with their centre portions white, and a bar of the same extends across the outer webs of the secondaries in the same position as the rufous edgings in the adult; lateral tail-feathers paler than the rest and tipped with white; throat a brownish or paler black than the head; the white of the chest narrower than in the adult; the pectoral band a paler and handsomer rufous, variable in width, and only continued in bars on the breast-plumes to a very limited extent; the abdomen and underlying breast-feathers with pale edgings; under surface of tail wanting the black patch.

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* An example in the British Museum from Nepaul, which has a wing of 9·4 and is not sexed, may be a female; a Ceylonese male, however, measures 9·3.

With age the back becomes blacker and more glossy, and the rufous colouring of the scapulars and tertials gradually gives place to the nigrescent adult hue; the white patch on the outer webs of the secondaries becomes rufous at the margins, and then black near the shafts, till in the old bird it finally disappears altogether.

Obs. The immature plumage of this bird appears not to have been hitherto described. In looking over the specimens in the National Collection, I came upon the example treated of above, which is undoubtedly in yearling plumage. The absence of the posterior tooth, the undeveloped crest, the pale edgings of the abdominal feathers, and the appearance of the under tail-coverts unmistakably indicate its immaturity, and have furnished a key by which at last the gradations in the plumage of this interesting species may be understood. The existence of this specimen precludes the possibility of the bird shot by Col. Tickell (J. A. S. B. 1833, p. 569) being the young of this *Baza*. This example was 18 inches in length, had a "fine long occipital crest black with white tips; the head, nape, and wing-coverts clouded with ashy and rusty; back clouded with brown; lower parts white, with a streak of black down the centre of the throat, and with rusty bars on the breast and belly." This bird cannot be referable to *B. lophotes*; but it may be *Sp. alboniger* or another species of the genus *Baza* (*B. jerdoni*?).

Distribution.—This beautiful Falcon is one of our rarest raptorial birds, and is, as far as observation has hitherto tended to prove, a cool-season migrant to Ceylon; and the fact of its having been observed to be migratory to Burmah and the east coast of India is, I think, for the most part, confirmatory of this belief. During its visits to the island it appears to confine itself mostly to the low country, and to be most partial to the northern half of the island. It was first recorded from Ceylon by Edgar Layard, who obtained a specimen near Jaffna, and who speaks in his "Notes" of another having been procured by Mr. Mitford, of Ratnapura. Subsequent observers do not seem to have met with it until Mr. Bligh obtained another, which was caught near Lemastota. In January 1876 I came suddenly upon a little troop of five in close company, and out of them secured an immature male. In the following October I saw another example near Ambepussa; and in January last year (1877), through the kindness of Mr. Chas. Byrde, of the Ceylon Civil Service, I received a second specimen, shot at Pasyala, in the Western Province. Mr. Simpson, of the Indian Telegraph Department, who has spent much of his time in the northern forests, and who is an accurate observer of birds, informed me that he had seen this Falcon at Kanthelai tank. Mr. Holdsworth mentions having seen specimens from the Kandy district which, with the exception of the evidence afforded by the Lemastota specimen, is the only record we have of its occurrence in the hill-region.

This species has a limited geographical distribution. As far as can be judged, it has its head-quarters in Assam and Burmah, and migrates thence down the east coast of India to Ceylon. Jerdon procured one specimen on the east coast near Nellore; and he remarks that it is occasionally killed at Calcutta, and is spread very sparingly throughout India. Of late years, however, it has not been recorded from the Deccan, North-west Provinces, Chota Nagpur, nor any of the western districts, the ornithology of all which regions has been so fully worked out in 'Stray Feathers'; neither has it been recorded from the Travancore, Palani, nor Nilghiri forests. It can only therefore locate itself in few places (and those far between) when it makes its annual visits to the Peninsula. The strangest feature in its distribution is, that it is likewise nothing more than a migrant to Burmah and Tenasserim. In the latter district Mr. Davison found it not uncommon in December and January throughout the southern parts of it; but no mention is made of its occurrence at other seasons, so that it is undoubtedly non-resident on the eastern side of the Bay of Bengal. There are specimens from Malacca and Pinang in the British Museum; but it has not been met with in the Andamans or Nicobars. Neither Mr. Oates nor Capt. Feilden appear to have found it in Upper Pegu; but in North-eastern Cachar, which lies to the north of it, Mr. Inglis found it consorting together, in November, in the same sociable manner that I did in the northern forests of Ceylon. Where, then, is its home throughout the greater part of the year? Where are those birds bred which mysteriously visit the above-mentioned regions for so short a time and again vanish as suddenly as they appeared? The northern portion of Burmah, together with the immense Chinese provinces of Yunan, Sechuen, and Quei Chorn, which lie to the north and north-east of the Burmese kingdom, are traversed here and there by extensive mountain-systems, such as the Palkoi, "Snowy," and other ranges—a vast and little-known ornithological district extending over 12° of latitude, all of which forms a territory sufficiently large to furnish a home for a bird of far less local disposition than a *Baza*. It is pretty certain that this species does not inhabit the more eastern parts of the Celestial Empire, for Père David makes no mention of its occurrence there or in the Moupin mountains in his new work on the Birds of China.

Habits.—This "Baza" frequents forest or large tracts of jungle, and usually keeps to districts of no considerable altitude. It appears to be more gregarious than most Hawks; for with the exception of the Kestrels and Kites, none seem to be so fond of each other's company. The little troop that I met with more resembled Pigeons in their actions than birds of the hawk-tribe; three were seated among the branches of one tree, and two others flew from branch to branch close by; when I approached the whole made off with short flight, from tree to tree, during which movement I dropped my bird. They had a quick irregular mode of flying, and with their white chests and handsome wings, contrasted against the green foliage, had a very unhawk-like appearance. I notice, with regard to their sociability, that Mr. Inglis, in the "First List of Birds from Cachar" ('Stray Feathers,' vol. v.), speaks of finding three in company with Bulbuls and King-Crows. Jerdon remarks that it is entirely insectivorous in its diet; and a pair that Mr. Mitford met with near Ratnapura, referred to by Layard in his notes, were catching bees on the wing, and also by darting at them as they issued from their hive; they sat on the dead branches of a tree, and raised and depressed their crests, and this they have the power of doing vertically, like the Crested Swift (*Dendrochelidon coronata*). Layard's specimen had a Lizard (*Calotes viridis*) in its stomach; and one of my birds, which was shot by Mr. Chas. Byrde, sitting in a jack-tree near the Rest House at Pasyala, had been feeding on Coleoptera. I know nothing of its note, nor can I find any thing recorded concerning it.

Jerdon writes of it in the 'Birds of India':—"It is almost entirely insectivorous in its habits, and keeps to the forests or well-wooded districts. It takes only short flights, and certainly is not usually seen soaring high in the air, as Mr. Gray says in his 'Genera of Birds.'"

Comparatively little is known concerning any of the Malayan members of this interesting genus, conspicuous in which, for its singular and beautiful plumage, is the present species. It is therefore to be hoped that naturalists in India and Ceylon will, when they have the good fortune to come upon it in their wanderings, pay particular attention to its actions and habits, as far as their opportunity will permit of.

ACCIPITRES.

FALCONIDÆ.

FALCONINÆ.

Genus FALCO.

Bill very stout and strong, short, the tip well hooked, and its margin indented with a deep notch or tooth; culmen curved gently from the base of the cere; cere well advanced. Nostrils circular, exposed, and with a tubercle. Wings long, much pointed, reaching in some to the tip of the tail; the 2nd quill the longest, the 1st subequal with the 3rd, and notched near the tip on the inner web; secondaries falling short of the primaries by more than half the length of the tail. Tail moderately short, stiff, and somewhat cuneate at the tip. Tarsus shorter than the middle toe, plumed somewhat below the knee, covered in front with small hexagonal scales. Toes very strong; middle toe much longer than the outer, which exceeds the inner; the whole shielded with narrow transverse scales nearly to the base. Claws much curved and acute.

FALCO PEREGRINUS.

(THE COMMON PEREGRINE.)

Falco peregrinus, Tunstall, Ornith. Brit. p. 1 (1771); Gm. S. N. i. p. 272 (1788); Gould, B. of Eur. pl. 21 (1837); Blyth, Cat. B. Mus. A. S. B. p. 13. no. 63 (1849); Kelaart, Prodromus, Cat. p. 115 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 101; Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 16. no. 18 (1854); Jerd. B. of Ind. i. p. 21 (1862); Gould, B. of Gt. Britain, pt. 1 (1862); Blyth, Ibis, 1866, p. 234; Hume, Rough Notes, i. p. 49 (1869); Jerd. Ibis, 1871, p. 237; Delmé Radcliffe, ibid. p. 363; Swinhoe, P. Z. S. 1871, p. 340; Holdsworth, P. Z. S. 1872, p. 410; Hume, Str. Feath. 1873, p. 367, et 1874, p. 140; Swinhoe, Ibis, 1874, p. 427; Legge, Str. Feath. 1875, p. 360; Hume, ibid. p. 443; Scully, Str. Feath. 1876, p. 117; Hume, ibid. p. 461; Dresser, B. Eur. pts. 47, 48 (1876).

Falco communis, Gm. S. N. i. p. 270 (1788, *ex* Buff.); Sch. Vog. Nederl. p. 6, pls. 1–3 (1854); Sundev. Sv. Fogl. p. 206, pl. 26. fig. 2 (1867); Sharpe, Ann. & Mag. Nat. H. 1873, xi. p. 222, et Cat. B. i. p. 376 (1874); David and Oustalet, Ois. de la Chine, p. 32 (1877).

Falco calidus, Lath. Ind. Orn. i. p. 41 (1790).

Falco lunulatus, Daud. Traité, ii. p. 127 (1800, *ex* Lath.).

Falco anatum, Bp. Comp. List B. Eur. & N. Am. p. 4 (1838, *ex* Audubon); Scl. et Salv. Ibis, 1859, p. 219.

Falco micrurus, Hodgs. in Gray's Zool. Misc. p. 81 (1844).

Le Faucon, Briss. Orn. i. p. 321 (1760).

Le Faucon pèlerin, Briss. Orn. i. p. 341 (1760).

Le Faucon sors, Buff. Pl. Enl. i. pl. 470 (1770).

Oriental Hawk, *Behree Falcon*, Latham, Gen. Syn. Suppl. p. 34* (1787).

"*Falcon*" (female), "*Tiercel*" (male), in Falconry; "*Duck-Hawk*" in America.

Bhyri (female), *Bhyri bacha* (male), Hind.; *Bhyri Dega*, Tel.; *Dega*, Yerklees (*apud* Jerdon); *Bahri* or *Water-haunting Bird*, Turkestan (*apud* Scully); *Basi*, Persia (*apud* Pallas); *Raja wali*, Malay; *Sikap lang*, Sumatra (*apud* Raffles); *Laki Angin* of the Passmumahs; *Halcón*, Spain.

Ukussa, Sinhalese.

Adult male. Length to front of cere 15·2 to 16·0 inches; culmen from cere 0·8; wing 12·6 to 12·8; tail 6·5; tarsus 1·9 to 2·05; middle toe 1·85 to 1·9, claw (straight) 0·65 to 0·7.

Adult female. Length to front of cere 17·5 to 18·5 inches; culmen from cere 1·05 to 1·2; wing 14·0 to 14·6; tail 7·3 to 8·5; tarsus 2·1 to 2·2; middle toe 2·1 to 2·3, claw (straight) 0·75; height of bill at cere 0·45 to 0·48. Weight of a female (wing 14·5) killed at Trincomalie 2 lb. 4 oz.

Iris dark hazel-brown; eyelid and cere above nostril rich yellow, greenish near the gape; bill pale blue at the cere and yellowish at the base beneath, darkening to blackish at the tips; legs and feet yellow.

Above bluish ashen, darkening into blackish or blackish brown on the head and hind neck, and paling into bluish grey on the rump and upper tail-coverts, all the feathers with dark shafts conspicuous on the back and scapulars, and banded with narrow, softened, wavy bars of cinereous blackish from the hind neck downwards; on the rump and upper tail-coverts these markings take a spear-shaped form; bases and sides of the feathers, in many examples, on the hind neck rufescent; least wing-coverts edged pale; quills dark brown, pervaded with ashy on the outer webs; the tips finely edged with greyish, the inner webs barred with rufescent grey or greyish white; tail dusky ashen, palest at the base, and crossed with narrow wavy bands of blackish, and tipped deeply with buff-white.

Forehead usually whitish close to the cere; lores, cheeks, and a short broad moustachial streak black; chin, throat, fore neck, and all beneath with the under wing-coverts white, tinged on the upper breast with faint isabelline grey, and often on the lower parts with bluish grey; the throat and fore neck unmarked, the chest streaked with narrow shaft-stripes of brown, which change gradually on the upper breast into the narrow wavy bars of blackish brown of the whole under surface and thighs; under wing-coverts with broader bars of the same.

Obs. It is the opinion of many naturalists, and among them Mr. J. Hancock, who has made the Falcons a life-long study, that the Peregrine, as well as other members of the genus, acquires its adult plumage at the first moult*. From observations I have made of a number of specimens in the barred plumage, but showing here and there a thorough immature feather, it seems evident to me that the change does take place in the second year. Notwithstanding this, however, it is equally evident that modifications take place in the adult plumage as the bird grows older; the streaks on the chest become finer and less numerous, and the change to the bars just beneath is more sudden than in the two-year old. Considerable variety exists in the depth of hue of the upper surface in birds from different parts of the world, and some examples are very rufous beneath; an instance of this coloration is afforded in the bird now in the Zoological Gardens, captured off Yucatan, which is almost as rufous as the Indian Peregrine. Asiatic-bred birds shot in India seem to be, as a rule, very heavily streaked on the chest.

"*Young male on leaving the nest* (Sharpe, Cat. B. i. p. 378). Brown, all the feathers edged with rufous, a clear greyish shade pervading the upper surface, and particularly distinct on the secondaries; head and neck rusty buff, the sides of the crown and occiput, the nape and hind neck, the feathers behind the eye, and the moustachial line mottled with blackish; under surface of the body rusty buff, with longitudinal median spots of dark brown, fewer on the thighs, and changing into bars on the under wing- and tail-coverts; throat paler and unspotted."

The bird of the year attains almost its full size before the first moult, and has the cere and bill much as in the adult; legs and feet greenish yellow.

When fully acquired the plumage is as follows:—Head, back, and wings dark brown, paling, in some, on the rump into light umber-brown, in others into cinereous brown, the feathers more or less edged with rufescent brown,

* Mr. Hancock argues from the testimony of caged specimens in his possession, which have invariably acquired the barred plumage at the first moult. Now all who have kept Raptors in confinement know that they are *slower* in acquiring their adult plumage, owing to loss of vigour, than when in a wild state; if, therefore, the Peregrine makes the sudden change in captivity, how much more must it do so in a state of nature.

paling on the scapulars into fulvous; front of the crown and the forehead whitish or fulvous, with the centres of the feathers blackish; sides of the hind-neck feathers marked with the same; shafts of the scapulars and upper tail-coverts black, and the tips of the latter part deeper than elsewhere; quills brownish black, barred on the inner webs with rufous-grey; tail cinereous brown, crossed with incomplete bars of rufous- or fulvous-grey and tipped deeply with whitish.

Cheeks and moustachial streak blackish brown, the white portion of the ear-coverts streaked with the same; chin, throat, and entire under surface white, in some slightly tinged with rufescent on the lower parts, and boldly streaked from the chest downwards with umber-brown; the markings are usually broader on the flanks, and in very many examples, even at this age, have a bar-like form; on the under wing-coverts the brown predominates, the white markings being confined to the tips.

Distribution.—The Peregrine was first recorded from Ceylon by Layard, who gives an account (*loc. cit.*) of shooting three specimens at Pt. Pedro in the month of January. Doubt has been thrown by the late Dr. Jerdon and others on Layard's identification, chiefly on account of the latter's statement that he found them nesting; but I have carefully examined the two specimens that still exist in the Poole collection—an adult and an immature bird; and there they are, veritable Peregrines, in spite of their having been found breeding in so strange a latitude as Ceylon. It appears to confine itself principally to the sea-coast during its visit to Ceylon, which is of course during the north-east monsoon. During the latter part of 1872 a pair frequented the Fort-Frederick cliffs at Trincomalie; but, fortunately for themselves, eluded several attempts I made to procure them; they tenaciously kept to one place on the face of the great "Sāmi" rock, where they commanded any approach to their haunt either by land or sea. In February 1874 Mr. R. Pole, of the Ceylon Civil Service, shot a fine female at Puttalam, which is now in the British Museum, and was the first procured since Layard's time, as far as I am aware. In October of the following year I failed in killing one which frequented the dead trees in the bed of the newly-restored tank at Devilane; but on the 28th of the same month I succeeded in shooting a female on the cliffs at Fort Frederick. During the cool season of 1876–77 another example, also a female, judging by its size, was observed by myself on two occasions in the cinnamon-gardens near Colombo; and in December of the same season I met with and wounded a second at the top of Allegalla Peak.

Beyond this latter locality, I do not know of any place in the mountain-zone in which it has been observed. This fine hill, which is one of the bulwarks of the mountain-range of Ceylon, rises 3400 feet sheer out of the low country, and consequently furnishes the present species with a seasonal shelter and the next with a permanent home.

The Peregrine is a cold-weather visitant to the peninsula of India, the Laccadive and the Andaman Islands; but a good many birds, probably young, remain behind in India, and take up their quarters on the borders of extensive jheels and tanks, attracted by the quantity of wildfowl and waders, which form their chief sustenance. It arrives, says Jerdon, in India, about the first week in October, and departs again in April, and during its visit is less abundant on the west coast than on the east. It is common in Burmah, and finds its way, according to Mr. Hume's observations, to the Andamans *viâ* Cape Negrais. Professor Schlegel records it from Sumatra; and on the east coast of China Mr. Swinhoe says that it is a permanent resident. Père David, however, remarks that it is driven by the Saker out of the south of China. It is not uncommon in Japan. It is spread throughout Central Asia, extending northwards into Siberia, and, according to Dr. Scully, remains about Yarkand even in the winter. Canon Tristram found it all times of the year in suitable localities on the coast, but to the eastward of the watershed of Central Palestine he never observed it.

It is distributed throughout the continent of Europe to the extreme north, and it occurs likewise in the islands of the Mediterranean. It is found chiefly on the coast-line of Northern Africa, being, however, not very abundant in Egypt, though it is, according to Mr. T. Drake, numerous in Tangiers and Eastern Morocco; southward it extends its range to Natal and the Cape. From the Canary Islands MM. Berthelot and Bolle record it; but it does not seem to have been noticed in Madeira. In the New World it enjoys a very wide range; commencing in Greenland it extends down the east coast to South America, and spreads across the continent to Vancouver Island, and thence along the entire Pacific coast of the continent to Peru, being replaced in Chili and to the south of that country still by *Falco cassini*, a species somewhat akin to the Australian Peregrine, *F. melanogenys*. It is not my province to go so minutely into its distribution as to record those localities from which it is absent; but from the above sketch of its habitat it will be seen that the Peregrine has one of the widest ranges of the birds of prey, rivalling even the Osprey in its wanderings.

Habits.—This noble Falcon is perhaps too well known to need much comment on its habits. Bold, swift on the wing, and keen-sighted to a degree, as well as extremely docile in confinement, the female has long been celebrated for its employment in the ancient and royal pastime of Falconry; and although this sport has declined much in Europe during the last century, it is still practised to a certain extent both on the continent and in England, the birds used with us being brought over principally from Holland, where they are netted. In India it has always, in common with the next species, been prized by the natives for Falconry, and is still trained there for that purpose; but used to be so, according to Jerdon, much more than now. He writes, in the 'Birds of India,' "It is trained to catch Egrets, Herons, Storks, Cranes, the *Anastomus, Ibis papillosa, Tantalus leucocephalus,* &c. It has been known, though very rarely, to strike the Bustard. Native falconers do not train it to hunt in couples, as is done in Europe sometimes. I may here mention that the idea of the Heron ever transfixing the Hawk with its bill is scouted by all native falconers, many of whom have had much greater experience than any Europeans. After the prey is brought to the ground, indeed, the Falcon is sometimes in danger of a blow from the powerful bill of the Heron, unless she lays hold of its neck with one foot, which an old bird always does. When the Kulung (*Grus virgo*) is the quarry, the *Bhyri* keeps well on its back to avoid a blow from the sharp, curved inner claw of the Crane, which can, and sometimes does, inflict a severe wound."

Jerdon comments on the curious mistake that artists, even Landseer included, have made in depicting the Peregrine as striking with its bill! This erroneous idea, however, is not confined to artists, for I have more than once seen it in the writings of naturalists. No raptorial bird that I have ever heard of uses its bill either for defence or offence; this organ is constructed for, and only used in, tearing the food on which the bird subsists. The talons alone are used in striking the quarry and in fighting or defending itself against attacks from any source whatever. I have kept half a dozen species of diurnal birds of prey, and have often had occasion to catch them by hand; but have never known one to use its bill when caught further than in giving a very incipient sort of peck. It is well known what a tremendous wound the Peregrine inflicts with the hind claw when striking its quarry; and in America, where it is called the "Duck-Hawk," on account of its partiality for ducks, these birds have been found with the whole back ripped up by the stroke of the Hawk's sharp talon, combined with the great momentum of its downward swoop. Peregrines have their favourite localities in India and Ceylon, which they tenaciously keep to throughout the season; they usually take up their quarters near water, and are very partial to sea-coast cliffs, which afford them a tolerably secure refuge. The birds that almost annually frequent the rocks at Trincomalie feed on the Pigeons frequenting the islets lying off the coast some 12 miles to the north. I observed them flying home at usually about nine or ten o'clock, when they would shelter themselves during the heat of the day, and sally out again in the afternoon. The favourite food of the Peregrine in India consists of waterfowl and waders, the latter being chiefly preyed upon by those birds which frequent the sea-coast. Mr. Adam writes that at the Sambhur Lake "they sit on stakes which are required to form a low retaining wall to separate a portion of the lake-water for the formation of salt, and from these perches they pounce on the numerous waders which feed along this wall." It is well known to what an extent Coleoptera are preyed upon in the East; and Mr. Pole assures me that the specimen he shot at Puttalam was flying round his compound at dusk, and appeared to be darting at the large beetles which were swarming in the air at that hour.

The ordinary flight of the Peregrine is regular and straight on end, being performed, as in other Falcons, with a quick wing-stroke; it is moderately swift, but nothing out of the common; when, however, it is in pursuit of a quick-flying quarry, such as a pigeon, duck, or limicoline bird, its wonderful powers of progression are fully brought out, and in making its final dash on the doomed victim its speed for the moment is estimated at 160 miles an hour.

Nidification.—As the Bhyri is not known to breed in India, the fact of its having been found nesting at Pt. Pedro by Layard has been a matter of dispute. As mentioned above, I have identified Layard's birds, and they are not the Jugger (*F. jugger*), as has been suggested; and consequently the interesting fact remains that the species (probably quite an abnormal occurrence in tropical latitudes) has bred in Ceylon. He writes as follows:—"I found them breeding in a palmyra tope on the left-hand side of the road from Jaffna to Pt. Pedro; the nest a rough structure of sticks laid on the dead '*matties*' or fronds of the palmyra, from which the leafy parts had been cut away. . . . . I shot the first specimen early in the month (January); but the

female was so shy that, though I long remained concealed near the nest, she never afforded me a shot, and I was obliged to return home without her. I was surprised to find another male at the same nest when I revisited the spot at the end of the month, and procured both him and his mate with a double shot."

Schlegel affirms that the Peregrine has bred in Sumatra; and Swinhoe found it nesting on the cliffs of North rock, in the province of Shantung, North China, and remarks that it appears to be a resident species down the whole length of the Chinese coast, young birds in their down having been brought to him at Amoy. No further testimony beyond that of these three writers is forthcoming of its breeding in the south-east of Asia or in the Indian empire southward of the Himalayas. Dr. Adams is supposed to have found its nest on the banks of the Indus; but the occurrence is mentioned with doubt, as to the correct identification of the bird, by both Jerdon and Hume; and the latter does not include it in his list in 'Nests and Eggs.' In more northerly latitudes it usually chooses an inaccessible cliff on which to build and rear its young. There, on some ledge which it deems secure from the attack of man, it constructs a nest of sticks, often mingled with the bones of its quarry, which, collecting year after year, have at last become part and parcel of the structure. The eggs are either three or four in number, and vary both in size and markings, these characters depending on the age of the bird. In Mr. Hewitson's plate (vol. i. of his 'British Birds' Eggs') are two examples: the first laid by an old bird, and measuring 2·13 by 1·7 inch; the second by a younger bird, not exceeding 1·92 by 1·55. In the larger of the two the general colour is reddish white, closely freckled, except at the small end, with brick-red, and blotched openly over that with reddish brown, the markings on the smaller half being the largest. The second egg is not so decided in its markings, is of a paler ground, covered with a stippled wash of pale reddish, in which there are a few darker clouds and several openly distributed large blotches round the centre.

FALCO PEREGRINATOR.

(THE INDIAN PEREGRINE.)

Falco peregrinator, Sund. Phys. Tidssk. Lund, 1837, p. 177, pl. 4; Gray, Gen. Birds, i. p. 19 (1844); Blyth, Cat. B. Mus. A. S. B. p. 14 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 102; Gould, B. of Asia, pt. 3 (1851); Blyth, J. A. S. B. xix. p. 321 (1851); Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 18. no. 20 (1854); Jerd. B. of Ind. i. p. 25 (1862); Hume, Rough Notes, i. p. 55 (1869); Jerd. Ibis, 1870, p. 237; Holdsworth, P. Z. S. 1872, p. 410; Sharpe, Ann. & Mag. Nat. Hist. ser. 4, xi. p. 223 (1873); id. Cat. B. i. p. 382 (1874); Legge, Str. Feath. 1875, p. 195; Hume, Nests and Eggs, p. 23 (1874): Walden, on Col. Tickell's MS. Ill. Ind. Orn., Ibis (1876), p. 342.

Falco shaheen, Jerd. Madr. Journ. x. p. 81 (1839); id. Ill. Ind. Orn. pls. 12 & 28 (1847).

Falco sultaneus, Hodgs. in Gray's Zool. Misc. p. 81 (1844).

Falco ruber, Schl. Mus. P.-B. *Falc.* p. 5 (1862).

The Shahin Falcon, Jerdon, B. of India; *Royal Falcon* of some.

Shahin, "Royal bird" (female), *Kohee Koela* (male), Hind.; *Jawolum*, Tel.; *Wallur*, Tam. *Ukussa*, Sinhalese.

Adult male (from Ceylonese and Indian examples). Length to front of cere 13·9 to 14·2 inches; culmen from cere 0·9 to 1·0; wing 11·4 to 11·6, expanse about 34·0; tail 6·0 to 6·4; tarsus 2·0; middle toe 2·1, claw (straight) 0·7; hind toe 0·85, claw (straight) 0·9; height of bill at cere 0·45.

Female. Length to front of cere 15·0 inches; culmen from cere 1·1; wing 12·0 to 13·3, expanse of the latter 38·2.

A male from Ceylon measured 11·6, and a female 12·8 in the wing.

Iris dark umber-brown; cere, eyelid, and gape ochre-yellow; bill dark plumbeous, changing to greenish near the cere; legs and feet chrome-yellow, claws black.

Head, hind neck, and upper back ashy blackish, deepest on the sides of the neck and paling gradually into bluish ashy on the rump and upper tail-coverts, the latter part being the lightest; all the feathers with dark shafts, the scapulars and wing-coverts edged with pale ashy and the lower back and tail-coverts crossed on the centre of the feathers with dark wavy bars, often concealed by the tips of the overlying feathers; lesser coverts darker than the median; quills blackish brown, the shorter primaries slightly pervaded with grey, and the whole narrowly barred on the inner webs with fulvous or light rufous-grey, according to the age of the bird; the secondaries paler than the primaries, and tipped with dull whitish; tail ashy blackish, tipped with rufescent and barred chiefly at the base with softened slaty markings; edge of the forehead buff with dark shafts.

Cheeks and moustachial stripe black, blending into the paler hue of the head; chin and throat rufescent white, passing on the chest into pale rufous, and from that into the rich rufous of the breast, flanks, and lower parts; shafts of the chest-feathers darker rufous than the web; flanks and under tail-coverts crossed on the centre of the feather with narrow lines of blackish; under wing-coverts dark rufescent, with darker shafts and cinereous black barrings; greater row brownish, barred with rufescent.

Obs. The rufous of the under surface is variable in depth, notwithstanding that the bird may be fully adult. Ceylonese examples in my collection correspond well with Indian, old birds, devoid of any barring on the breast, being scarcely less dark on the head and hind neck than the blackish-headed Nepaul birds (*Falco atriceps*, Hume).

Some examples in the British Museum from Northern India present puzzling characteristics. There is one from Simla, presented by Capt. Pinwill, which has the appearance of a rather small Common Peregrine with a very rufous under surface. The feathers of the back and rump and the scapulars are as much barred as in *F. peregrinus*; the chest is marked with fine mesial points like that species; the breast and lower parts are rufous-grey, and barred with narrow cross rays of blackish brown as in an old Peregrine, with the exception that the markings are closer together; the flanks and under tail-coverts are likewise tinged with bluish grey.

Young. Wing of a male 10·6 inches. Cere yellowish, tinged with green, in some entirely bluish; legs and feet greenish yellow.

Above brownish black, the feathers of the back and wing-coverts with fine pale margins, the scapulars tipped with rufous and some of the concealed portions of the feathers barred with the same; rump edged with rufous, upper tail-coverts tipped and barred with a paler hue; quills deep brown, the bars of the inner webs more rufous than in the adult; tail barred obscurely with rufous, which on the central feathers is of a dusky hue.

Cheeks and moustachial stripe blackish brown; throat and chest white, passing into rufescent buff on the breast and flanks; the chest and the white space above the moustache streaked with shaft-lines of brown, expanding at the tip; breast streaked broadly with brown, the lower flank-feathers deeply tipped and marked with bar-like spots of the same; the abdomen, under tail-coverts, and thighs are paler than the breast, the former streaked similarly to the chest and the thighs more boldly marked, some of the longer feathers having bar-like spots; under tail-coverts barred with brown; under wing-coverts whitish, with irregular cross-markings of brown.

At the first moult the following change takes place:—the rump and the base of the tail assume a cinereous hue, the edgings of the scapulars are less conspicuous, the bars of the primary inner webs become paler and the shaft-stripes on the chest narrower, the breast and flanks darker rufous, this hue extending to the belly and thighs, and the stripes on the flanks turn into bars.

The back and rump from this stage onwards begin to turn grey, the shafts of these parts and of the scapulars standing out darkly; the stripes on the centre of the breast disappear altogether in some examples, leaving the flanks barred to a greater or less extent.

Distribution.—This bold and handsome Falcon was recorded by Layard (*loc. cit.*) as having been shot by his collector and servant near the beautiful upland plain of Gillymally. The account of the specimen in question referred chiefly to its long wings causing the native "Muttoo" to think that it was a "large Swift," deceiving Layard also, who says of the bird, "which I also mistook for a Swift, so much did its wings overlap its tail." I have carefully examined the whole collection at Poole, and there is not in it any example of *F. peregrinator*; but there is one of a female *Falco severus*, a bird not recorded by Layard in his list. I am therefore of opinion that he did not correctly identify the bird shot on the occasion in question, but that it was in reality a specimen of the Indian Hobby, to which his remarks as to length of wing &c. would relate with correctness. I have written to him on the subject; and in his last letter to me from New Caledonia he says that he has no doubt the bird was the latter species. Should this surmise be correct it is difficult to say when the bird was first discovered in Ceylon; but I imagine that my reference in 'Stray Feathers,' 1875, to the Pigeon-Island specimens is the first actual record of the bird's occurrence in the island. It is resident in Ceylon, but by no means common, and frequents such very retired spots or inaccessible cliffs that it is rarely met with by the ordinary sportsman. A pair usually affected the cliffs at Fort Frederick during the cool season, dividing their time between foraging on the mainland and making inroads upon the Rock-Pigeons which swarmed at the island beyond Nilāvele. At this spot a pair out of three or four birds which had taken up their abode on the northern face were killed by myself and a brother officer in October 1874. This island is an out-of-the-way locality, which, stocked as it is with fine pigeons, forms a welcome refuge for the Shahin. As it has so seldom been shot in Ceylon, I quote here the following passage from my notes in 'Stray Feathers':—"The islet is situated 14 miles north of Trincomalie at about $1\frac{1}{2}$ mile from the mainland. Near this place, about $\frac{1}{2}$ a mile nearer the shore, is another rocky islet frequented by flocks of *Columba intermedia*, which furnish many a dainty meal for the Royal Falcon. Pigeon Island itself is rarely visited except by fishermen, who can only land at the south side, where there is a little beach backed by a tangled thicket, which rises gradually to the pinnacle in the centre, whence the northern side descends in the form of a perpendicular face right into the sea. This cliff, under which it is very difficult to pass on foot, forms a splendid shelter for the Shahin; for he can perch and roost on the shelves which jut out into the numerous crevices in the face of the rock without being disturbed by any one in the island who does not choose to scramble along the almost inaccessible rocks at its foot. I visited the spot on the 6th October 1874, in search of pigeons, and finding none, was clambering over the rocks on an adjoining islet, separated at high water from the main portion, when I espied a large Falcon coming along over the water and making for the cliff. I quickly turned back, reached the cliff, and got out on to an enormous boulder which enfiladed the precipice, affording a good view of the whole of it, but not a vestige of the Falcon was to be seen. I then determined to get right underneath, and jumped across a

chasm to a lower boulder, from which I could see almost every spot in the precipice; but still no falcon. I then shouted, and out shot three splendid fellows, which I missed with my first barrel; but back they came, dashing up to the rock, and not caring the least for my shot, when bang went the weapon, and down came a fine fellow between two large rocks, where I judged him to be safe, and then fired several shots at impossible distances at the other two, which wheeled and dashed round the summit of the hill in such a manner that I thought they must be breeding. After a while the third bird made off, the second disappearing suddenly from the battle-field. Thinking it was about time to pick up my dead bird, I made my way across and through the water to the spot where I had dropped him, and to my extreme disgust found that he had fallen into a sluice, out of which the first receding wave must have carried him. Not a sign of my prize anywhere; high and low I searched, and at last gave up in despair, convinced that a monstrous blue rock-fish, with which the water beneath the cliff swarmed, had long since polished him off! On returning to the other side of the island, where my companion was hungrily waiting breakfast, the first sight that greeted me was a magnificent winged *Shahin* hanging by his knotted primaries to the branch of a tree. My companion (Major Sir John Campbell) had dropped him as he shot past; and hence his sudden disappearance from my side of the island." Elsewhere in the lower country I have met with the Shahin in the Friars-Hood district, and at Yakkahatua mountain near Avisawella; and Captain Wade, 57th Regt., shot a fine adult specimen at Tissa-Wewa Tank, near Anaradjapura, in December 1875. In the hill-zone it is more often seen, and no doubt breeds in the mountains. I killed an old male at the top of the celebrated Yakka rock, Hewahette, in May 1876, and in the following month Mr. Bligh procured another in Haputale. During the same season a young bird, which I saw afterwards alive in the possession of Messrs. Whyte and Co., was caught in the act of dashing at some pigeons near Kandy. I have seen it on the Alagalla Peak, in the precipices of which I have reason to believe it nests.

This Falcon was first described by Sundevall from a specimen which settled on the vessel he was sailing in, "in lat. 6° 20′ N., between Ceylon and Sumatra, rather nearer the last-named island, and at least 70 Swedish miles from the nearest land, viz. the Nicobar Islands." From what follows in the Professor's remarks on this occurrence, he was of opinion that it was either flying to or from Sumatra. It has not, however, been discriminated from that island; and it is more probable that the specimen in question was on its way to or from the Nicobar Islands, but where also it has not been found up to the present time. It is said by Jerdon to be found "throughout the whole of India, from the Himalayas to the extreme south, extending into Affghanistan and Western Asia." As regards the two latter regions I imagine that it has been here confounded with another species, as the bird does not appear to extend beyond the confines of the Indian empire, and the northern race, inhabiting even the Himalayas, is separated as *F. atriceps* by Mr. Hume. I have, however, examined individuals in the National Collection from Nepaul, and they are not separable from Ceylonese specimens. It is more often found in Central than Upper India, and is more frequent still in the South, inhabiting the Nilghiris and breeding there. In the Carnatic it is seldom met with; but in the Eastern Ghauts it is tolerably common, according to Jerdon, breeding there, and migrating in the young stage to the former locality. As this writer has stated, it is no doubt far from being a common bird, confining itself to forest-clad districts. I observe that it is not mentioned in Mr. Fairbank's list of birds from the Palani Hills, nor in Mr. Bourdillon's from Travancore, although Jerdon shot it in the latter district. Col. Tickell states that it is a commoner species in Burmah than in India, and that he frequently observed it on the sea-side at Amherst. It must be local, however, in Burmah, as I do not find it recorded thence by any of the naturalists whose work has been described of late years in 'Stray Feathers.' With regard to the specimens of this Falcon said to have been procured at sea in the Indian Ocean, I have to remark that the bird mentioned by Mr. Whyte (Ibis, 1877, p. 149) as being captured in the Gulf of Socotra, and belonging to the present species, has eventually proved to be a Common Peregrine; and I am strongly of opinion that the source to which the presence of another (mentioned in a footnote, 'Stray Feathers,' 1877, p. 502, as being procured in 1833 on board ship between Mauritius and Madagascar) might be traced is that which has led to many mistakes in "distribution," viz. an escape from a state of confinement.

Habits.—In Ceylon the Indian Peregrine frequents lofty mountain-precipices or inaccessible cliffs on the sea-coast. It is an excessively shy bird, retiring when not engaged in the pursuit of its quarry to sequestered ledges, and easily escapes all notice, unless observed to fly towards its retreat. It is as bold and courageous

in the hunt as its larger and more esteemed congener; but of course is not so powerful in its attack on large birds. It is taught to catch partridges, florikin, and jungle-fowl by native falconers in India, and is usually caught by the ordinary contrivance of bird-lime, with which it comes in contact on stooping at a decoy-bird. Jerdon, who narrates, in his work on the 'Birds of India,' that it is trained for what is called "a standing gait," or the art of hovering or circling in the air over the falconer and his party, says that "it is indeed a beautiful sight to see this fine bird stoop on a partridge or florikin which has been flushed at some considerable distance from it, as it often makes a wide circuit round the party. As soon as the Falcon observes the game which has been flushed, it makes two or three onward plunges in its direction, and then darts down obliquely with half-closed wings on the devoted quarry with more than the velocity of an arrow." I can testify to the accuracy of this account of the Shahin's powers of flight, as I was once myself an eye-witness to its capturing a Palm-Swift at Trincomalie. A little colony of these birds had their nests in a solitary palmyra-palm which grew near the sea-beach; and one evening I observed one of these Falcons, which had been haunting the cliffs of the Fort, dash past me, and, mounting higher and higher, go away at a tremendous pace, and with a twisting flight, for about 300 yards. I could not see at the moment what he was pursuing, as it was getting dusk; but he suddenly checked himself and shot down with meteoric swiftness almost into the sea. I then perceived a poor little Swift just in front of him; close to the surface of the water it dashed along in a horizontal direction for about 100 yards, closely pursued by the Falcon, and then twisted hither and thither for the space of a few seconds, the Shahin following its every movement, until he struck it with his talons, and, seizing it in his bill, flew past me to the cliff. These Falcons frequently sally out thus from their perch about sunset, and make a meal off the first unlucky bird that crosses their path; and they would seem to have rather a partiality for Swifts and Swallows, for I noticed the bird I shot at the Yakka rock dart at a Swallow that was flying about the cliff. They may be always distinguished from the Peregrine on the wing, even at some little distance, by their smaller size and by the conspicuous blue-grey of the rump. I have now and then observed them perch on trees; but I think it is the exception for them to do so, as they prefer the rocks of the precipices about which they almost entirely live. This species lives exclusively on birds; and Jerdon remarks that in India it kills large quantities of game, partridges, quails, &c., and that it is very partial to parrakeets. He observes, further, that its habits vary according to the locality in which it lives, birds from open districts, where they require to be more on the wing in pursuit of their prey than in forest districts, being by far the best fliers and the most useful in falconry. It is more highly prized by the natives than any Falcon in the East, the Peregrine being considered even second to it.

Nidification.—But little is known concerning the nidification of this Falcon. I have no doubt whatever but that it breeds in such localities as the Yakka rock, Alagalla Peak, and perhaps in the low country in hills like Yakdessagalla, Rittagalla, Friars Hood, &c. It nests usually on inaccessible cliffs. Jerdon mentions three eyries in India—one at Rutoor, another in the Nilghiris, and a third near Mhow. It builds a nest of sticks on a projecting or receding ledge of rock, and sometimes takes possession of the old nest of another Raptor. Mr. Hume speaks of an egg taken by Mr. Blewitt in the Raipoor district as being narrow and oval, of a pale pink ground-colour, clouded with pale purplish, and finely speckled and spotted with deep reddish brown. It measured 2·0 by 1·43 inch. This egg was taken in January; but Jerdon says it lays also in March and April.

FALCO SEVERUS.

(THE INDIAN HOBBY.)

Falco severus, Horsf. Trans. Linn. Soc. xiii. p. 135 (1822); Blyth, Ibis, 1863, p. 8; Schl. Vog. Nederl. Ind., Valkv. pp. 4, 45, Taf. 2. figs. 2, 3 (1866); Radcliffe, Ibis, 1871, p. 366; Sharpe, Cat. B. i. p. 397 (1874); Bourdillon, Str. Feath. 1876, p. 354.

Falco aldrovandii, Temm. Pl. Col. i. pl. 128 (1823).

Falco rufipedoides, Hodgs. Calc. Journ. N. H. iv. p. 283 (1844).

Falco guttata, Gray, Cat. Accipitr. Brit. Mus. p. 26 (1844).

Hypotriorchis severus, Gray, Gen. of B. i. p. 20 (1844); Blyth, Cat. B. Mus. A. S. B. p. 14 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 22 (1854); Jerd. B. of Ind. i. p. 34 (1862); Wallace, Ibis, 1868, p. 5; Hume, Rough Notes, i. p. 87 (1869); Holdsworth, P. Z. S. 1872, p. 410; Walden, Trans. Zool. Soc. viii. p. 33 (1872).

The Severe Falcon, *apud* Horsf. & Moore.

Dhuti (female), *Dhuter* (male), Hind.

Allap-Allap-Ginjeng, Java.

Adult male. Length to front of cere 10·3 to 10·5 inches; culmen from cere 0·65; wing 8·0 to 9·0; tail 4·5; tarsus 1·1 to 1·2; middle toe 1·2, claw (straight) 0·5; height of bill at cere 0·27.

In 'Stray Feathers,' vol. iv. p. 355, the wing of a male shot in Travancore is given at 9·25. This is *most exceptional*, or it is a misprint for female. Two Ceylonese examples, one of which, on account of its small size, must be a male, measure 8·6 and 9·0. Three males in the Norwich Museum, from the Philippines and Java, measure 8·3, 8·6, and 8·7; two others in the British Museum do not exceed 8·3; Jerdon, however, gives the wing of a male as 9·0, from which I have taken the above limit.

FALCO CHICQUERA.

(THE RED-HEADED MERLIN.)

Falco chicquera, Daud. Traité, ii. p. 121 (1800, *ex* Levaill.); Less. Traité, p. 90 (1831); Gould, Cent. B. Him. Mts. pl. 2 (1832); Blyth, Cat. B. Mus. A. S. B. p. 14 (1849); Sharpe, Cat. Birds, i. p. 403 (1874).

Hypotriorchis chicquera, Gray, Gen. B. i. p. 20 (1844); Kelaart, Prodromus, Cat. p. 115; Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 102; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 23 (1854); Jerd. B. of Ind. i. p. 36 (1862); Holdsworth, P. Z. S. 1872, p. 410; Butler, Str. Feath. 1875, p. 444.

Æsalon chicquera, Kaup, Class. Säug. u. Vög. p. 111 (1844).

Chicquera typus, Bp. Rev. et Mag. de Zool. 1854, p. 536; Hume, Nests and Eggs, p. 19 (1873).

Turumtia chicquera, Blyth, Ibis, 1863, p. 9.

Lithofalco chicquera, Hume, Rough Notes, i. p. 91 (1870); Anderson, P. Z. S. 1871, p. 681.

Toorumtee, Europeans in India.

Turumti, *Turumtari*, *Tutri mutri* (female), *Chetwa* (male), Hind.; *Jellaganta*, *Jelgadda*, Telegu; *Jelkat*, Yerklees (*apud* Jerdon).

Adult male. Length (from skin) to front of cere 10·5 inches; culmen from cere 0·7; wing 7·9 to 8·1; tail 5·0; tarsus 1·3 to 1·5; middle toe 1·3, claw (straight) 0·48; height of bill at cere 0·35.

Adult female. Length to front of cere 11·0 to 12·0 inches; culmen from cere 0·65; wing 9·2 to 9·7; tail 4·9; tarsus 1·3 to 1·4; middle toe 1·3, claw (straight) 0·5. The wing sometimes reaches 0·5 beyond the tail.

Iris deep brown; cere and bill at base yellow, the upper mandible and tip of the lower blackish; legs and feet yellow. claws black.

Entire face, head, hind neck, and interscapular region glossy black, paling into blackish slaty on the back, wings. rump, and upper tail-coverts; the feathers on these parts have the shafts black and the bases blackish brown, the slaty hue being confined to the tips of the feathers; on the head and hind neck there is an ashen hue; quills blackish brown, the inner webs more or less barred with rufous (in some very old birds these are almost absent or reduced to pale transverse dashes); tail slaty black, tipped finely with rufous, and in some with a subterminal band, such examples having the outer feathers with rufous or greyish bars on the inner webs. Some examples have undefined slaty bars across the whole tail.

Throat and fore neck buff, tinged with rufous, the colour running up into the sides of the neck, all beneath from the fore neck, with the thighs, under tail- and under wing-coverts, deep chestnut or ferruginous; under primary-coverts paler rufous, barred with black; the remainder of the wing-lining with black shaft-lines; sides of the chest with a few black patches, running into the black hind neck; middle of the chest usually with a few black shaft-lines.

Young. The immature bird is almost as dark above as the adult; but the exposed portions of the sides of the hind-neck feathers are more or less rufous, the central tail-feathers are crossed with greyish markings, and the inner webs of the remaining feathers barred with rufous; extreme tips of the secondaries whitish; chin and throat as in the adult, the rufous of the under surface not quite so deep; the chest streaked with drop-shaped striæ of black, and the breast and flanks marked with oval central drops, the thighs and under tail-coverts with central streaks, longer and narrower than the breast-markings.

Distribution.—The handsome Indian Hobby can only be classed in our lists as a straggler, having been but twice procured in the island. The first record of it as a Ceylonese bird is contained in Mr. Holdsworth's Catalogue (*loc. cit.*), from a specimen shot by Mr. Bligh, at Catton Estate, Haputale; but from recent investigation, as noticed in the preceding article, I find that Layard killed another example, which is, in all probability, referable to his *Falco peregrinator* shot at Gillymally; and he therefore must be looked upon as the discoverer of the species in Ceylon. I imagine that both these specimens were killed during the cool season, and that without doubt the species is migratory to Ceylon, as it is to South India.

This Hobby is a bird of fairly wide distribution, being found throughout the whole of the Indian peninsula

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Adult female. Length to front of cere (from skin) 13·0; wing 8·5 to 9·1; tail 6·5 to 6·8; tarsus 1·6 to 1·7. Weight 8·5 oz. (*Hume*).

The above measurements are from N. Bengal and Nepaul specimens.

"Iris rather light brown; orbits yellow; bill greenish yellow at base, bluish black at tip; legs and feet pure (slightly orange) yellow." (*Hume.*)

Head, back, and sides of neck cinnamon-rufous; a moustachial streak of a paler hue than the head, between which and the eye is a blackish streak; a dark superciliary line; back, rump, scapulars, and wing-coverts bluish slate, paling gradually towards the tail, and blending somewhat into the hue of the neck; the feathers of these parts with dark shafts; wing-coverts at the point of the wing barred with blackish grey; feathers along the ulna edged with rufous, and beyond this the edge of the wing is buff-white; primaries deep brown, the inner webs barred narrowly with white, not reaching on the terminal half to the edge of the feather; primary-coverts and secondaries slate-grey, the inner webs albescent and barred with blackish grey; tail pale bluish grey, lighter than the coverts, deeply tipped with greyish white, and crossed with a broad subterminal black band, the remainder crossed with narrow widely separated rays of blackish grey.

Chin, throat, sides of the face, and under surface white, barred from the breast downwards with blackish grey or dark slate-colour, and the markings on the centre of the breast somewhat pointed at the middle of the feather; flanks more heavily barred than the breast; under wing-coverts white, the external feathers with dark mesial lines, the inner ones barred like the chest.

Females that I have examined in the British Museum have the under wing-coverts more darkly barred than males. The tail-band appears to fade very much in this species, turning brown when the feathers become old.

from the Himalayas to Travancore, and likewise in the Malayan peninsula, whence it extends through the whole Asiatic archipelago by way of Celebes and New Guinea to the Philippines. I have seen specimens of it from Java, Salwati, Borneo, and Makassar; and it in all probability inhabits many of the smaller islands in the Malayan region. In India it is chiefly confined to the Himalayas; but it is not very numerous even there, and does not extend to the north of this range. A few visit the plains in the cool season, and it is often killed in the neighbourhood of Calcutta. Colonel Radcliffe procured it near Futteghur in 1866; and Mr. Bourdillon in Travancore, where it is a winter visitor only. It does not appear to have been detected often, if at all, in Burmah, as I can find no record of its occurrence there in 'Stray Feathers;' it has, however, been found further south in the peninsula, and it will very likely be met with some day in Tenasserim or Pegu.

Habits.—This stout little Falcon frequents mountainous country, dwelling chiefly about heavy jungle and

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Distribution.—I assign my notice of this bird as belonging to the Ceylonese ornis to a footnote for the same reason as in the case of the Sparrow-Hawk, viz. that its occurrence on the island is not a matter of absolute certainty. Layard writes (*loc. cit.*), "I saw this pretty Hawk in the flat country near Pt. Pedro, but could not get a shot at it: I cannot, however, be mistaken in the bird, as I long watched it with my telescope." He writes me from New Caledonia, "You may safely include *Hypotriorchis chicquera*;" and I therefore do so in the way I have adopted for the treatment of those species which have not been actually procured. There is no reason whatever against inferring that this little Falcon now and then visits the northern shores of Ceylon, as it is found in the extreme south of the peninsula. Jerdon says that it is spread throughout India from north to south, but is rare in the forest-districts, as it chiefly affects open country in the vicinity of cultivation. It does not appear to be procured so often in the south as in the northern parts of India and on the outskirts of the Himalayas—the province of Nepaul, to wit. Captain Hayes Lloyd found it common in the Kattiwar district, Western India; and further north in the northern Guzerat region, Captain Butler writes, in 'Stray Feathers,' "it is not very common, but appears to be distributed pretty evenly throughout the plains." In the eastern parts of the peninsula it is not so common. Mr. Ball says that it is of very rare occurrence in Chota Nagpur, and that he only once observed it in the Satpura hills."

Habits.—This pretty little Merlin is a most courageous bird, and appears to be a general favourite with sportsmen in India on account of its boldness, powers of flight, and interesting habits. It frequents compounds, groves of trees, the edges of isolated woods, or even single trees in open country, whence, Jerdon remarks, it "sallies forth, sometimes circling aloft, but more generally, especially in the heat of the day, gliding with inconceivable rapidity along some hedge-row, bund of a tank, or across some fields, and pouncing suddenly on a Lark, Sparrow, or Wagtail." It often hunts in pairs, and sometimes hovers for a few seconds like a Kestrel. It feeds on small birds almost entirely, but will occasionally kill the smaller mammals, Mr. Hume recording that he has found the remains of squirrels in their stomachs; they have also been known to fly at Bats in the dusk of the evening. It is occasionally used by falconers, and flown at small game and also at the Roller and at Pigeons. Jerdon writes, "In pursuit of the Roller it follows most closely and most perseveringly; but is often baulked by the extraordinary evolutions of this bird, who now darts off obliquely, then tumbles down perpendicularly, screaming all the time and endeavouring to gain the shelter of the nearest tree or grove." Captain Butler gives a most interesting account (*loc. cit.*) of the performances of one of these brave little birds, which I subjoin here:—"Upon one occasion I remember shooting into a small flock of *Cursorius gallicus*, wounding two and killing a third. One of the wounded birds, before falling, flew 'pump-handling' for some distance close to the ground, and the other one towered. One of these beautiful little Merlins at once appeared on the scene, and followed in pursuit of the towering bird to a height of 300 or 400 feet. As soon as the Courier became aware of his presence he closed his wings and dropped to the ground like a stone, followed of course by the Turumti, who stood erect by his side on my arrival, staring at him as if it was the first bird he had ever seen. On my approaching the spot the Courier again took wing followed by the Merlin; and thinking he might fly some distance, I shot him. The Merlin took no notice whatever of the report of the gun, but made a stoop at the falling bird and accompanied it to the ground. I then walked up to the spot and drove him away.

"After picking up the Plover I turned round and, to my unutterable surprise, I saw the Falcon on the top of the other wounded bird. I ran up to them, and found a desperate struggle going on; and it was not until I nearly knocked the plucky little fellow over with a stone that I induced him to leave his intended meal."

The cry of this species is a shrill angry scream.

forest, which furnish it with a supply of small birds, on which it is said chiefly to feed. Mr. Bligh's specimen was shot hawking after dragonflies; and no doubt the bird feeds as well on lizards, which form a large proportion of the food of most Indian Raptors, from the Hawk-Eagle downwards. It is said to be crepuscular in its habits. Mr. F. Bourdillon, in 'Stray Feathers' (vol. iv. p. 354), says that its cry is shriller and weaker than that of the Kestrel; he is also of opinion that it breeds in Travancore. Wherever it does it must be in remote or inaccessible forests, for nothing appears yet to be known concerning its nest and eggs. Jerdon remarks that it nidificates on trees; and Mr. Thompson, as quoted in Mr. Hume's 'Rough Notes,' says that it breeds in Kumaon. He writes, "These birds regularly resort to the dense forests on the lower ranges of Kumaon and Gurhwal about April. In June I watched a female bearing a small bird away, but could not find where she took it to. I infer from this that she must have had a nest of fledged young ones, as there were lots of fine trees standing close to where she passed me, and where she might have stopped to pluck her quarry. Later observations confirm me that the bird breeds about April in our lofty and dense forests."

Nidification.—The Toorumtee nests exclusively on trees, making its own nest, and building a fresh one every year. It is neatly built of both stout and fine twigs closely put together, and lined with fine roots and vegetable fibres, mixed sometimes with straw, feathers, or pieces of rag, which are firmly interwoven with the body of the nest. It is generally fixed in the fork of the top branch of a large tree, such as a mango, peepul, or tamarind, where these are to be found; but where they do not exist, it is placed in small trees, sometimes not more than 10 feet above the ground. The eggs are usually four in number; but sometimes three and five are laid. They vary from "a pale yellowish brown, with just a few reddish-brown specks, to a nearly uniform dark brownish red, obscurely mottled and blotched with a somewhat darker red." Sometimes there is a ring of feeble blotches round the large end, and at others a zone of darker markings round the middle. They average 1·66 inch in length by 1·27 in breadth. The breeding-season lasts from January till May.

ACCIPITRES.

FALCONIDÆ.

FALCONINÆ.

Genus CERCHNEIS.

Bill shorter and more suddenly curved than in *Falco*; wings as in that genus, but the 1st quill shorter, and the 1st and 2nd notched on the inner web. Tail longer than in the last; tarsi longer and more feeble. Lateral toes nearly equal, the scales rectangular up to the base of the toes.

Of small size. Sexes generally differing in coloration. Sternum weaker than in *Falco*.

CERCHNEIS TINNUNCULUS.

(THE COMMON KESTREL.)

Falco tinnunculus, Linn. Syst. Nat. i. p. 127 (1766); Gould, B. of Europe, i. pl. 26 (1837); Yarr. Brit. B. i. p. 52 (1843); Schl. Vog. Nederl. pls. 9, 10 (1854); Sharpe & Dresser, B. of Eur. pt. 2 (1871); Newt. ed. Yarr. Brit. B. p. 79 (1872).

Falco alaudarius, Gm. S. N. i. p. 279 (1788).

Cerchneis tinnuncula, Boie, Isis, 1828, p. 314; Sharpe, Cat. Birds, i. p. 425 (1874); David & Oust. Ois. de la Chine, p. 36 (1877).

Tinnunculus alaudarius, Gray, Gen. Birds, i. p. 21 (1844); Blyth, Cat. B. Mus. A. S. B. no. 69, p. 15 (1849); Kelaart, Prodromus, Cat. p. 115 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 102; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 13 (1854); Gould, B. Gt. Brit. pt. ii. (1862); Jerdon, B. of Ind. i. p. 38 (1862); Tristram, Ibis, 1865, p. 259; Hume, Rough Notes, i. p. 96 (1869); Holdsworth, P. Z. S. 1872, p. 410; Du Cane Godman, Ibis, 1872, p. 165; Hume, Nests and Eggs, p. 21 (1873); Legge, Ibis, 1874, p. 10; Scully, Str. Feath. 1876, p. 120; Brooks, Str. Feath. 1876, p. 228.

Cerchneis alaudarius, Hume, Str. Feath. 1876, p. 460.

L'Epervier des Alouettes, Briss. Orn. i. p. 279 (1760).

La Cresserelle, Briss. Orn. i. p. 393 (1760).

"*Windhover*," "*Stonegall*," popularly in England; *Cernicalo*, *Primilla*, Spanish (Saunders); *Francilho*, Portuguese; *Sweef*, Moorish (Drake); *Narzi* (female), *Narzanak* (male), Hind. (Jerdon); *Khurmutia*, *Kurumtia*, *Karontia*, Hind. (Blyth); *Nardunak*, Scinde; *Gytthin*, *Tondala-muchi gedda*, lit. "Lizard-killing Kite," Tel. (Jerd.); *Kurganak*, Turkestan (Scully). *Ukussa*, *Kurullagoya*, Sinhalese; *Walluru*, Ceylonese Tamils.

Adult male. Length to front of cere 12·5 to 13·5 inches; culmen from cere 0·6; wing 9·6 to 10·2 (9·7 to 9·9 being the average); tail 6·5 to 7·0; tarsus 1·4 to 1·6; mid toe 1·05 to 1·15, claw (straight) 0·45; height of bill at cere 0·35.

In a large series examined in the British Museum I find that Asiatic examples measure as much as, if not more than, European, the largest specimen, having a wing of 10·2, being from Behar.

Iris dark brown; cere and eyelid chrome-yellow; bill adjoining cere and at the base beneath paler yellow, darkening to bluish at the tips; legs and feet chrome-yellow, claws black.

Head, back, and sides of neck, together with the moustachial stripe, ashy bluish, the feathers with dark shafts; lower part ofhind neck, back, and wing-coverts cinnamon-rufous, with an arrow-headed blackish-brown spot, more or less broad, at the tip of each feather, developing on the tertials into a subterminal bar; quills and their coverts ashy brown, the inner webs with bar-like indentations of rufescent white, and all with pale tips; rump, upper tail-coverts, and tail clear ashy blue, with a broad subterminal blackish bar across the latter; edge of forehead, lores, throat, and the space between the cheek-stripe and the ear-coverts buff-white, the latter more or less shaded with ashy; beneath, from the throat, rufescent white, in some specimens isabelline grey, the feathers of the chest and upper breast with dark brown striæ, and those of the breast and flanks with terminal drop-shaped spots; the lower parts and under tail-coverts unspotted, the thighs being, as a rule, more rufous than the abdomen; under wing-coverts marked with pointed central spots.

The above is a description of a fully-aged bird, in which a bluish cast often pervades the entire upper surface.

In a slightly younger stage of adult plumage, and one in which most birds are procured in Ceylon, the head is more or less washed with rufous, the markings of the back and wing-coverts are larger, and the rectrices, though blue, present in various degrees a certain amount of barring; in some this appears on the central feathers, either at the base or down most of the web, in others these are devoid of any markings, while the inner webs of the outer feathers are crossed with narrow transverse lines. In this stage, however, the head is very variable, being not always tinged with rufous as above stated, but, at times, as blue as in the oldest birds.

Young. In the bird of the year the wing averages from 9·5 to 9·8 inches in the male, and slightly more in the female.

Soft parts much the same as in adult; cere slightly greenish in some; legs and feet not so bright in hue.

Head and upper surface dusky rufous, usually paler on the hind neck and rump than elsewhere; feathers of the head and hind neck with broad brown striæ, and the back, rump, and wing-coverts crossed with broad bars of brown, the shafts being of the same colour; quills brown, tipped pale, most deeply on the secondaries, the inner webs partially crossed from the edge with rufous or rufescent yellow; tail dark rufous in some, yellowish rufous in others, with continuous or interrupted bars of blackish brown, and a broad terminal band of the same, the outer feathers paler than the rest; forehead and round the cere fulvous, with dark shafts to the feathers, a broad, dark, moustachial stripe crossing the gape from the lores; ear-coverts fulvous-grey, shading off into brownish; throat and under surface rufescent white, palest on the abdomen and under tail-coverts, which, with the chin and gorge, are unstreaked; chest, breast, and flanks streaked with brown, the markings on the chest being broader than on the breast, on the lower part of which they diminish to mesial lines; under wing-coverts buff-white, lined and spotted (on the longer feathers) with dark brown. In a large series no constant variation can be found between male and female, notwithstanding that females appear sometimes to have the thigh-coverts and lower parts more striated than the other sex.

In the next stage towards the mature dress the tail, after moult, becomes ashy blue, completely barred with brown, the upper tail-coverts changing at the same time to bluish, and the bars on the back and wings fading out. Birds are occasionally found with the tail composed, in the same moult, of the adult blue and immature red feathers.

Adult female. Length, including culmen, 14·0 to 15·0; wing *averaging* more than the male's, but seldom exceeding the highest of the above dimensions. In an immature example shot at Colombo it measures 10·5.

Upper plumage of a browner rufous than the male; in very old birds the head with a bluish cast, the stripes and bars respectively of the head and back narrower and darker than in the young, and the latter slightly spear-shaped: in some birds, as in the male, a faint ashy hue is perceptible on the upper surface; upper tail-coverts bluish ashy, with either spear-shaped streaks or narrow mesial stripes on the longer feathers, or the whole crossed with narrow bars; tail bluish ashy at the base and down the centre of all the feathers, the edges shading into rufous and crossed on both webs with narrow bars of blackish brown, incomplete at the base of the central feathers; tip as in the male; under surface a paler, but generally finer rufescent than in the male, and more boldly streaked on the chest and spotted on the breast; in examples which are heavily barred above the flanks have transverse markings.

Birds not fully adult betray their youth in the greater amount of rufous on the tail and its coverts.

Obs. It has lately been ascertained that the female Kestrel is capable of acquiring a somewhat masculine plumage, a pair having been shot at the nest at Aldenham, Hertfordshire, in 1874, in which the female had the tail bluish, barred with black. An account of this remarkable occurrence is given by Mr. Sharpe in the 'Proceedings of the Zoological Society,' 1874, p. 580, pl. 68.

Distribution.—This well-known bird, the "Windhover" of the English farmer, migrates, in the cool season,

freely to Ceylon, remaining in the island until the usual time of departure, the coming-in of the following south-west monsoon, when it takes wing for its breeding-haunts in more northern climes. It spreads over the whole island, without respect to locality or elevation, frequenting the entire seaboard, the low country of the interior, and the elevated plateau of the main range, while the intermediate coffee-districts come in for an equal share of its patronage. It is commonly met with about Colombo, frequenting the cinnamon-gardens and cocoanut-groves along the Galle road; at the southern port it always takes up its quarters in the huge ramparts fronting the esplanade; and at Trincomalie it is numerous in the season, dwelling in the lofty precipices and mural rocks encircling the Fort, and sallying out to the extensive esplanade in search of food. In the Jaffna peninsula and round the north coast of the island generally it is plentiful, and it is likewise common on all the adjacent islands of Palk's Straits. Although abundant in Ceylon, it never occurs there in flocks similar to those that have been seen by Blyth near Calcutta, or by Captain Shelley in Egypt.

The permanent habitat of the Common Kestrel is the entire continent of Europe and Northern Asia, whence it migrates in the winter into Northern Africa, the Indian peninsula, and North China, and it occasionally wanders into South Africa and even into the Seychelles. Although it leaves India for the most part in the breeding-season, it remains in the Himalayas in considerable numbers, and on the other side of the chain it is, according to Dr. Scully, a permanent resident in Turkestan. It appears to be only a winter visitor to Burmah, as neither Capt. Feilden nor Mr. Oates record it as remaining there in the hot season. The latter gentleman says that it is common in the Pegu plains; but it does not continue its migration as far south as Tenasserim, for I do not find any mention of it in either the first or second list of birds from that province contained in 'Stray Feathers.' Blyth found it very common in Lower Bengal, where it was seen by him in parties of twenty or thirty together. In Chota Nagpur Mr. Ball says that it is tolerably abundant in most parts; the same remark applies to nearly all parts of the Indian peninsula, for this little Hawk is dispersed throughout the whole of it, irrespective of elevation; there are, however, some districts in which it is not so numerous, for Mr. Hume found it numerically scarce in the plains of Sindh. Mr. Bourdillon remarks that it is a winter visitor to the Travancore hills, and that it breeds there; on Mount Neboo, 7000 feet high, in the Palani Hills, which form an eastern offshoot of the same range, Mr. Fairbank observed it until June, and remarks that he thinks it resides permanently there. It has also been found to be a permanent resident in some parts of the Nilghiris; but Mr. Hume says these southern birds belong to a "smaller and markedly deeper-coloured race," which is perhaps peculiar to the south of the peninsula, and may merit entire specific separation from its ally, which is migratory to the whole country as well as to Ceylon, the latter place forming the southernmost limit of its wanderings. It is certainly remarkable that while a vast stream of Kestrels overruns annually the whole of the region in question, there should exist a certain quantum which, in addition to a different character of plumage, should possess the peculiar habit of remaining stationary and breeding in the hills of the extreme south of the peninsula. This peculiarity in the Kestrel's economy is not, however, confined to South India; the same occurs in Madeira and in Abyssinia; and Mr. Sharpe solves the difficulty by pointing out that there is undoubtedly a *dark resident* form of this species to be found in certain localities along the southern limit of its habitat. As regards South India, I imagine that the Kestrels found in the low country of this region belong to the migratory class, as they certainly do in the island of Ramisserum, where they are very numerous during the north-east monsoon. Mr. Hume remarks that the Kestrel is the commonest Raptor in the cold season at the Laccadive group, and that the specimens he obtained "were all of the European type," which is, of course, the case with those in Ceylon.

In the northern part of the sister continent of Africa, the Kestrel locates itself in great numbers during the winter. Captain Shelley found it swarming in Egypt, and once saw as many as one hundred together in a clump of palm trees, attracted there by the clouds of locusts which were passing them. In Tangier and Eastern Morocco, Mr. T. Drake found it common; and beyond this, towards the Atlantic, it wanders sometimes into Western Africa. Mr. Godman found it, however, common in the Canaries and in Madeira, the birds in the latter place being resident and belonging to the dark race. With regard to Europe and Northern Asia, the permanent habitat of the species, my limited space compels me to pass over its distribution there; and I would merely remark that Canon Tristram found it especially abundant in Palestine, inhabiting every variety of locality, and breeding gregariously in the ruins characteristic of that country. Mr. Sharpe remarks that the Japan Kestrels are the largest and darkest of any of the races of this species.

Habits.—As in England so in Ceylon, the Kestrel prefers open to wooded country, taking up its abode near commons, pasture-land, brush-covered plains, large tracts of dried-up "paddy-field," and any locality on which its prey (lizards, mice, and small mammals) is exposed to its view. It takes up its quarters on high rocks and precipices, always returning to the same roost, and is very regular in its hours for coursing over the surrounding country in quest of food. Two or three pairs lived annually in the ramparts and cliffs at Trincomalie; in the morning they sallied out, returning for their midday rest about 10 o'clock, and passed the heat of the day under some projecting points in the lofty mural sea-face, now and then flying round the Fort, or alighting on the pretty parade-ground, surrounded with fine old trees, in which they often engaged in fierce and quarrelsome harangues with one or two Goshawks (*Astur badius*), who objected strongly to the annual invasion of their territory by the smart little Kestrels. In the afternoon, about 3 o'clock, they departed again on their rounds, and were to be seen until evening about the esplanade or among the Suriah trees (*Ibiscus*) lining the public roads. The Kestrel has a rapid flight, sustained with quick beatings of the wing, and is capable of making sudden and very swift stoops on its prey. It, however, usually hovers over such animals, reptiles, and insects as it feeds on in the remarkable manner for which it is so well known, and drops suddenly down, extending its talons as it reaches the ground, and then usually devours what it has captured on the spot. The skill with which it poises itself, after hovering for some seconds, its wings perfectly motionless and its body suspended, as it were, from the heavens by an invisible thread, is marvellous. I have seen it in such a position in a strong wind, not precisely facing the direction of the current of air, but with one wing pointed up to it—the primaries of which, yielding to the force of the wind, every now and then would give back, but as quickly spring forward into their normal position, while the rest of the body remained unmovable!

Its principal food consists of lizards and large beetles in Ceylon; but in Europe it is an inveterate destroyer of field-mice, although it is not generally accredited with such useful habits, but rather believed to be an enemy of the game-preservers, and frequently pays the usual barn-door penalty at the hands of ignorant keepers. Professor Newton remarks, however, in his late edition of 'Yarrell's British Birds,' that "it does occasionally kill and devour small birds, and at times the young of larger ones." Concerning this assertion I have only to remark that I feel convinced such occurrences are exceedingly rare, and that in Ceylon I am sure it is entirely an insect- and reptile-feeder. It has been known to catch cockchafers on the wing, seizing them in its claws and devouring them while flying. It doubtless kills the locusts, on which it is said to feed in Egypt, in the same manner. Of its habits in Yarkand and Turkestan, generally, Dr. Scully writes:—"It feeds chiefly on mice, lizards, and *grasshoppers*; the Yarkanders add frogs and, in winter, sparrows. In the stomach of a Kestrel killed at Yepchan, I found, among other things, a rat's tail 6 inches long." Messrs. Sharpe and Dresser, in their admirable work on the Birds of Europe,' quote from the remarks of Dr. E. Hamilton, on the habits of this species, the following passage concerning its vermin-killing propensities:—"I have trained the Kestrel myself to come to the lure, but never could get it to swoop at birds, although I have starved it almost to death; but put a mouse before it, and it would immediately take it. . . . . Birds, when given, were always left half plucked or half uneaten, as if distasteful."

Notwithstanding the evidence I have adduced to show my readers that this favourite little Falcon is in the main harmless as regards bird-life, it cannot be entirely absolved from all such offence, for it has been known to suck the eggs of the Missel-Thrush, and also to carry off very young Partridges in England; but it must be said that the latter crime seems very unnatural when taken in conjunction with Dr. Hamilton's evidence as to its distaste for bird-flesh. As has been shown above, this Kestrel is somewhat gregarious when it becomes very numerous in a locality; but it is not so much so as the next species. In some parts of Asia its tameness and sociability are remarkable. Dr. Scully remarks, in his interesting journal of his trip to Turkestan, "a couple of Kestrels (*Tinnunculus alaudarius*) seem to have taken up their abode here; they fly about from the rafters of the verandah to the poplar trees just outside my room."

Nidification.—The Kestrel was formerly supposed not to breed within Indian limits; of late years, however, since so much attention has been paid to the subject of ornithology, it has been found nesting in the Himalayas and outlying districts in Cashmere, in the Central Provinces, and in the Nilghiris. This latter locality, however, is only resorted to by the small dark-coloured resident species, which appears to be peculiar

to those hills. Its favourite situations in India for building its nest are crevices and overhung ledges in the face of high cliffs; but it has also been found nesting in trees, and in England, as is well known, frequently takes possession of a crow's nest. The structure is sometimes bulky, and at others the reverse, the requirements of the situation no doubt determining the design. It is made of sticks and lined with small twigs and grass-roots, sometimes intermingled with pieces of rag. The eggs are usually four in number, of a brick- or blood-red ground-colour, freckled or spotted with deep red, with occasionally a few blotches or clouds of the same. The average of 19 eggs, according to Mr. Hume, was 1·57 by 1·21 inch.

In some countries the Kestrel breeds together in colonies, and even in company with other birds. Canon Tristram remarks, in his "Notes on the Ornithology of Palestine":—"It is generally gregarious, ten or twenty pairs breeding in the same ruins, and rearing their young about the end of March. It often builds its nest in the recesses of the caves which are occupied by Griffons; and is the only bird which the Eagles appear to permit to live in close proximity to them. At Amman, too, it builds in the ruins in company with the Jackdaws; and in several places, as at Lydda and Nazareth, large colonies are mixed indiscriminately with those of the following species (*Tinnunculus cenchris*)."

CERCHNEIS AMURENSIS.

(THE AMURIAN KESTREL.)

Falco vespertinus, Schrenk, Reis. Amurl., Vög. p. 230 (1860).

Erythropus vespertinus, Horsf. & Moore, Cat. B. E. I. Co. Mus. no. 13, p. 14 (1854); Swinh. Ibis, 1861, pp. 253, 327, et P. Z. S. 1862, p. 315; Jerd. B. of Ind. i. p. 40 (1862); Hume, Rough Notes, i. p. 106 (1869); Jerd. Ibis, 1871, p. 243; Legge, Str. Feath. 1873, p. 487; Hume, Str. Feath. 1875, p. 22.

Falco vespertinus, var. *amurensis*, Radde, Reis. Sibir. ii. p. 102, Taf. 1. figs. 1–3 (1863).

Erythropus amurensis, Gurney, Ibis, 1868, p. 41, pl. 2; Swinhoe, P. Z. S. 1870, pp. 436, 448, 1871, p. 340, et Ibis, 1873, p. 96, et 1874, p. 425; Hume, Str. Feath. 1875, p. 22.

Tinnunculus amurensis, Gray, Hand-l. B. i. p. 23 (1869).

Falco raddei, Finsch u. Hartl. Vög. Ostafr. p. 74 (1870).

Cerchneis amurensis, Sharpe, Cat. B. i. p. 445, et Str. Feath. 1875, p. 303; Legge, ibid. p. 362; Inglis, ibid. 1877, p. 6; Hume, ibid. p. 7.

Falco amurensis, Dav. & Oust. Ois. de la Chine, p. 34 (1877).

Le Kobez de l'Amour, David & Oustalet.

The Eastern Red-footed Kestrel, *Radde's Kestrel*, *The Orange-legged Hobby*, *The Red-legged Hobby*, *The Red-legged Falcon* of Indian writers; *White-clawed Kestrel*, Blyth; *Ingrian Falcon*, Lath. (*apud* Horsf.).

Karjanna, *Karjoona*, Hind. (Jerdon).

Adult male. Length to front of cere 9·8 to 10·7 inches; culmen from cere 0·5; wing 8·8 to 9·2 (in a South-African example in the British Museum, 9·5); tail 4·75 to 5·0; tarsus 1·1 to 1·2; mid toe 0·95 to 1·0, claw (straight) 0·38.

Iris brown; cere (all but the tip of bill), orbital skin, and eyelid gamboge-yellow; tip of bill dark leaden: legs and feet gamboge-yellow, claws whitish horn-colour.

Head, hind neck, back, wings, and tail dark slate, the forehead darker than the crown, and the rump paler than the back; the interscapular region, scapulars, and shoulder of the wing suffused with blackish; quills slate-grey, the shafts black and the inner part and under surface of web brownish; shafts of the tail-feathers brownish black; cheeks, cheek-stripe, and ear-coverts concolorous with the head; chin, throat, sides of neck, breast, and flanks bluish ash-colour, palest on the throat, the shafts of the breast-feathers more or less conspicuously dark; belly, thighs, and under tail-coverts dark rufous; *under wing-coverts and axillary plume white*, with dark shafts in examples which have them conspicuously so on the breast.

A younger stage of the adult phase has the throat and round the cheek-stripe whitish, and the under parts paler ashy than in the above-described old dress; the abdomen and under tail-coverts are also paler or yellowish rufous.

Adult female. Wing 9·4 to 9·6 inches.

Soft parts as in the male.

Above leaden-grey, paling to bluish ashy on the rump and tail; the head and nape suffused with brownish, and the feathers with dark shaft-stripes; bases of the hind-neck feathers rufous-yellow, showing across that part; back and wing-coverts barred with brownish black; quills blackish, the inner webs crossed with bar-like spots of whitish; tail crossed with seven or eight blackish-brown bars and a broad subterminal band of the same.

Forehead, throat, cheeks, and chest whitish buff; lores and a narrow moustachial streak blackish; the throat unstreaked, but the chest with mesial stripes, and the breast and flanks with arrow-headed bars of blackish brown; abdomen, thighs, and under tail-coverts pale rufescent yellowish, this hue extending further up the breast in some than in others; under wing-coverts white, barred and "lined" with blackish brown.

Young. In the British Museum are a pair of nestlings taken in China from the same nest—one with the wing 7·5, the other 7·6 inches. They are not sexed; but the larger of the two may be presumed to be the female.

The presumed male is the darker in colour, the ground-colour of the under surface being rufous-buff; the head and nape brownish slate, the feathers with dark shafts; the back, scapulars, and wing-coverts, as also the rump and tail, paler slate-colour, the whole crossed with blackish-brown marks, and each feather with a deep cinnamon-rufous tip; on the hind neck there is a rufescent-buff collar, formed by the lateral edges of the feathers; tail barred with interrupted bands of dark brown, and a broader one at the tip; quills slaty black, tipped with fulvous-white, and the inner webs crossed with transverse spots of white; thighs unmarked.

Cheeks and a small moustachial stripe and ear-coverts blackish; chin and throat buff-white, deepening into the more rufescent hue of the under surface; the breast with broad central drops of blackish to the feathers, which change into arrow-headed bars on the lower flanks.

The female has the tail less barred than the male, and the under surface buff, with broad spear-headed mesial marks on the chest-feathers, and the markings on the breast have the same character, instead of being plain stripes as in the male; the thigh-plumes marked with dark mesial lines.

As the bird grows older the rufous margins fade, and the barrings become more subdued, the bird of the year presenting a cinereous-brown hue on the head, hind neck, upper back, and scapulars; the feathers of the upper parts with pale margins and dark shafts, and those of the wing-coverts and scapulars fulvous-grey, while the tips of the rump and upper tail-coverts are greyish white and tolerably deep; the primaries and secondaries are tipped with white, the latter more deeply, the quills are dark cinereous brown, the inner webs crossed with white, similarly to the adult female; tail bluish ashy, with 10 or 12 narrow brown bars.

The cheeks, ear-coverts, a space behind the eye, and a more or less developed moustachial streak blackish; throat, sides of the neck, and under surface to the lower breast in some birds quite white, while others have these parts buff; the abdomen, thighs, and under tail-coverts are likewise variable from buff to almost white; forehead whitish; the throat and sides of the neck are unmarked, but the breast is striped with bold dashes of blackish brown, almost covering the feathers on the chest and upper breast; flanks often barred with the same.

The Ceylonese specimen mentioned below was a male in this stage of plumage; the lower parts were scarcely tinged with buff.

The young of both sexes at this stage much resemble the adult female, except that the under tail-coverts and abdomen are often nearly white; these latter parts vary, however, considerably in birds of the first year.

Obs. The transition in the male bird from the greyish barred upper plumage to the adult dark slate is complete in one moult; but the throat in several examples that I have examined has remained white, probably not acquiring the bluish ash-colour until the next season. The distinguishing character in this species consists in the white under wing-coverts, which suffice to separate it from the western Red-footed Kestrel, which has those parts dusky bluish grey: this character was first pointed out in 1863 by Radde, previous to which time the two species were confounded; and the bird spoken of by Jerdon, Horsfield, and others must be referred to the eastern race, and not to *E. vespertinus*, the western form. This latter has not been found nearer India than the Tumlienshian Steppe, Western Siberia. There Radde procured it, and, travelling eastwards, met with no species of Red-footed Kestrel until *C. amurensis* appeared in Amoorland.

Distribution.—The occurrence of this pretty little Kestrel in Ceylon is perhaps one of the most interesting in the history of Ceylon ornithology. The solitary example procured by myself at Trincomalie in December 1872, and recorded as *Erythropus vespertinus* (*loc. cit.*), is the only one that has yet been found in the island or in any part of Asia so far to the south. It was a straggler which found its way under the influence of the north-east wind to the shores of Ceylon; and, judging by the thin state of its body, had only just terminated its flight across the briny deep or down the east coast of India.

The eastern Red-footed Kestrel has its head-quarters in Amoorland and North China, and in the cold season performs, perhaps, the most singular migration of any known bird, encroaching on the path of its near ally, *Cerch. vespertina* (with which it was long confounded, until Radde discovered the differences between the two species), and actually reaching the southernmost regions of Africa. It passes from its home in North China into Burmah, Nepaul, and other sub-Himalayan provinces, Lower Bengal, Central India, and terminates, as a rule, its Indian migration in the Nilghiris, in which hills Jerdon killed it, but where, I imagine, it is very rarely seen. Mr. Hume has received it from Madras. From the north of India the migratory stream sets westward through Asia to the east coast of Africa, along which it flows to the Zambesi district, and thence southward to Natal, Damara Land, and Cape Colony. It was first known from Natal, whence Mr. Ayres

sent specimens to Mr. Gurney in 1867, having found it numerous in that province; subsequently he observed numbers in the Transvaal, in December 1870, but did not meet with them in that district on any other occasion. It was procured in the Cape Colony by Mr. Andersson, and there are specimens in the national collection from Zambesi, presented by Dr. Livingstone and Dr. Kirk. It does not appear to have been yet observed in Egypt, which leads to the inference that it passes into Africa by way of Arabia, probably entering the continent in Abyssinia, and thence passing along the east coast to the south. It is at times numerous in Cachar, where it arrives, according to Mr. Inglis, in October, and disappears after February; during the former month, in 1875, he met with a flock of some hundreds of them hawking on a new tea-plantation. In Upper Pegu, Capt. Feilden has procured it, or met with it, in January and February; but it does not appear to wander down the Malay peninsula; for it has not yet been recorded from Tenasserim. About April it returns from its migrations to China, Mr. Swinhoe recording its arrival in Chefoo in that month, and at the same time Père David says it makes its appearance in the plains of China and Mongolia.

Habits.—This Red-legged Hobby has most of the habits of its near ally *C. vespertina*, resembling it in its gregarious tendencies, its crepuscular manner of hawking, and its insectivorous diet, while it also has somewhat in common with the ordinary Kestrel of Europe, hovering like it over its prey, though not in the same motionless manner peculiar to the "Windhover." During its migrations from Northern China to other countries, it associates in large flocks to an extent unusual in the Falcon tribe. As mentioned above, Mr. Inglis observed this habit in Cachar; and in South Africa, Mr. Ayres "found a lot of these pretty Falcons hunting with much assiduity; they were crossing backwards and forwards over the driest end of the swamp with an exceedingly rapid flight, and were taking insects on the wing." The favourite food of this bird appears to be grasshoppers, cockroaches, beetles, &c., to the first of which it is most partial. Its love of insect diet leads it to frequent open commons, plains, downs, dry marshes, and such like. It likewise feeds on white ants, which, indeed, do not seem to come amiss to any Indian bird, from the long-winged Kite down to the fruit-eating Barbet. The example I shot in Ceylon was frequenting the dried-up esplanade at Trincomalie; it constantly hovered near the ground, and then descended, proceeding, on alighting on the grass, to jump on the grasshoppers which attracted it, seizing them in its talons and devouring them on the spot. Contrary to its usual habit, it was very tame, the cause of which doubtless lay in its meagre frame; for though its stomach was distended with grasshoppers, it had but little flesh to boast of. The late Mr. Swinhoe is the only writer who speaks of this species killing birds, which it appears to do in China; and it is even trained at Chefoo to hawk small birds, which, it must be remarked, is somewhat unusual for a Kestrel.

Nidification.—The Amurian Kestrel breeds in China in the nests of Magpies, which build in tall trees of avenues or gardens near dwelling-houses. Swinhoe found it laying in the nests of the two species which inhabited the vicinity of Chefoo, viz. *Pica media* and *Cyanopolius cyanus*. The former builds a domed nest, and the latter, the Blue Magpie, an open one; but both come in for the patronage of this little Kestrel. The time of breeding is in May; but no information is given concerning the eggs, as the nests were in inaccessible trees, or, at any rate, such as baffled the attempts of the Chinese coolies to climb them. I am unable to discover any additional reference to these birds breeding beyond that contained in Swinhoe's notes from Chefoo to which I have alluded, and which are contained in 'The Ibis,' 1874, p. 428.

ACCIPITRES.

Suborder PANDIONES.

Differs structurally from Falcones in having the outer toe reversible. Plumage very close and compact, otherwise as in Falcones.

Genus PANDION.

Tip of upper mandible much lengthened, curved at right angles to the commissure and very acute; lobe variable in development. Wings long and pointed, exceeding the tail; the 3rd quill generally the longest. Tail of 12 feathers and even. Tarsi short, stout, reticulated, as are also the toes to the last joint. Soles of the feet prickly, and the claws *rounded beneath*, much curved; outer toe reversible. Feathers wanting the accessory plumule.

PANDION HALIAETUS.

(THE OSPREY.)

Falco haliaetus, Linn. S. N. p. 129 (1766).

Pandion fluvialis, Sav. Descr. Egypte, Ois. p. 272 (1809).

Aquila haliaetus, Meyer in Mey. u. Wolf, Tasch. i. p. 23 (1810).

Accipiter haliaetus, Pall. Zoogr. Rosso-As. i. p. 355 (1811).

Balbusardus haliaetus, Flem. Brit. An. p. 51 (1828).

Pandion haliaetus, Less. Man. d'Orn. i. p. 86 (1828); Gould, B. of Eur. pl. 12 (1837); Gray, Gen. B. i. p. 17, pl. 7. fig. 5 (1845); Blyth, Cat. B. Mus. A. S. B. p. 29 (1849); Bp. Consp. i. p. 16 (1850); Schleg. Vog. Nederl. pl. 30 (1854); Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 52 (1854); Jerd. B. of Ind. i. p. 80 (1862); More, Ibis, 1865, p. 9; Tristram, Ibis, 1865, p. 253; Hume, Rough Notes, i. p. 234 (1869); Gould, B. of Gt. Brit. pt. xvii.(1870); Newton, ed. Yarr. Brit. B. i. p. 30 (1871); Holdsworth, P. Z. S. 1872, p. 412; Shelley, B. of Egypt, p. 203 (1872); Sharpe, Cat. Birds, i. p. 449 (1874); Dresser, B. of Eur. pt. 49 (1876).

Pandion alticeps, Brehm, Vög. Deutschl. p. 33 (1831).

Pandion carolinensis, Audub. B. N. Am. pl. 81, et Orn. Biogr. i. p. 415 (1831).

Pandion indicus, Hodgs. in Gray's Zool. Miscel. p. 81 (1844).

The Fishing-Hawk, Catesby, N. H. Carol. i. pl. 2 (1731).

Le Faucon pescheur de la Caroline, Briss. Orn. i. p. 362 (1790), also *Aigle de Mer*, Briss. ibid. p. 440.

Le Balbuzard, Buff. Pl. Enl. i. pl. 414.

"*Fish-Hawk*," popularly, America and England; *Fischaar*, *Fischhabicht*, German; *Visch-*

Arend, Dutch; *Aguila pescadora*, Spanish; *Aguia presqueira*, Portuguese; *Halász-Sas*, Transylvania. *Mesago*, Japanese (Blakiston).

Machariya, Hind.; *Verali addi pong*, Tam. (Jerdon); *Matchmorôl*, Beng.; *Macharang*, Nepaul; *Wonlet*, Arracan; *He-pew*, "Fish-Tiger," Chinese (Swinhoe).

Adult female. Length to front of cere 20·0 to 23·0 inches; culmen from cere 1·5 to 1·65; wing 19·5 to 20·5; tail 8·0 to 9·0; tarsus 2·2 to 2·3; longer anterior or middle toe 1·7 to 2·0, its claw (straight) 1·15; height of bill at cere 0·55. Weight 3½ lb. (*Jerdon*).

Male. Wing 18·0 to 19·0 inches; tarsus 2·0 to 2·2; middle toe 1·6 to 1·8.

The above measurements are taken from a series of Asiatic examples, one from Beloochistan being the largest.

Iris yellow; cere plumbeous; bill black, paling to bluish at the gape and base of under mandible; legs and feet greenish in some, yellowish in others; claws black.

The colours of the legs and feet are variously given as greenish and yellowish. An example shot in Ireland, May 14, 1878, and examined in the flesh by myself, had the soft parts as follows:—Iris reddish yellow; cere dark plumbeous; bill blackish horn-colour, paler at gape; legs and feet pale bluish, slightly tinged with green.

Head and hind neck white, the feathers on the centre of the crown, above the eye, a postorbital band running over the ears and down the side of the neck, as also the terminal half of the occipital crest blackish brown, but less in extent in very old birds; some of the feathers on the side of the nape with dark shaft-stripes; lower part of hind neck, back, scapulars, and wing-coverts glossy pale brown, with a purplish lustre in newly-plumaged birds; longer primaries (from the first to the fifth) black-brown; the remainder and the secondaries paler brown, tipped with dull white; the inner webs white towards the base, with the brown hue partially divided into bars; upper tail-coverts tipped with white; tail sandy brown, tipped with whitish, and crossed, except in very old birds, with subdued bars of a darker hue; inner webs of the lateral feathers white; the shafts of the rectrices white; beneath white.

The cheeks striped with brown, and the chest washed with fulvous, with streaks of brown in many examples; flanks streaked partially with brown; under wing-coverts barred with brown and tipped with fulvous, those beneath the edge of the wing browner than the rest.

Obs. The brown colour of the chest seems to be an individual variation, independent, in some cases, of age, although it appears to be, as Mr. Sharpe remarks, generally more marked in the old birds, which are plainly distinguishable by their unbarred tails. In these latter, however, it varies in extent and character, being accompanied, when very marked, by an encroachment on the throat of the side-neck stripe. In some examples the underlying crest-feathers are often rufous, this being a remnant of the immature plumage, which appears to remain in such birds; in other specimens the wing-coverts retain a certain amount of pale edging.

Young. Mr. Sharpe (*loc. cit.*) describes the nestling as being "covered with down of a sooty-brown colour, except along the centre of the back, along the carpal bend of the wing, on the breast and flanks, where it is dusky white; all the feathers of the back are dark brown, with a broad tip of ochraceous buff; crown and ear-coverts blackish; eyebrow and throat white."

*Bird of the year**. Above chocolate-brown, the back, scapulars, and wing-coverts with sharply defined white tips to the feathers, separated from the brown by a buff margin; the wing-coverts more conspicuously edged than the back; the postorbital stripe broader than in the adult, and terminally edged with fulvous; the white sides of the nape and the back of the neck not striated as in the adult; primaries and secondaries deeply tipped with fulvous-white; upper tail-coverts margined and tipped with fulvous; tail barred with six or seven narrow bands of brown, conspicuous on the central rectrices; fore part of crown dark brown; crest-feathers often edged with fulvous; beneath white, chest sometimes unmarked, at others washed with fulvous and streaked with brown as in old birds.

Distribution.—This cosmopolitan bird of prey, as a matter of course, takes the island of Ceylon into its range, visiting its northern parts in fair numbers during the cool season, a few birds continuing their course to the extreme south. Although previously received by Lord Tweeddale from Ceylon, Mr. Holdsworth, in his catalogue (*loc. cit.*), was the first to include the Osprey among the birds of the island, having observed it on a

* A Tangier example and one from Nootka Sound, North America, are identical in plumage.

solitary occasion in Galle harbour, in which locality I myself saw it in March 1872. During the period of its stay it is tolerably common on the Jaffna lake and about the shoal water surrounding the adjacent islands and skirting the coast as far south as Manaar. In this latter island, Mr. Simpson, of the Indian Telegraph Department, who resides there, informs me it is to be met with all the year round. Should this gentleman be correct in his observations, it is in all probability a resident likewise in the neighbouring island of Ramisserum, where I have seen it in January and March in greater numbers than anywhere else. Lord Tweeddale's specimens were procured in the north of the island. At Trincomalie I observed it on several occasions during two successive seasons, and in February 1877 I met with an example near Morotuwa, at the head of the Panadura lake, and not ten miles from Colombo. I have no record of the Osprey having been seen on any of the large inland tanks in the north of the island, and I believe it confines itself exclusively to the sea-coast in Ceylon.

The Fish-Hawk, although nowhere very numerically abundant, inhabits suitable localities throughout the entire globe, with the exception of the island continent of Australia, its adjacent islands, including New Zealand, parts of the Malay archipelago, and all but the northern parts of South America. There are certain places in which it is not found, and some from which it is unaccountably absent, such as the Black Sea, from which, according to Mr. Dresser's remarks of Prof. Nordmann's experience, it has not yet been recorded. In Palestine its absence from one spot is noteworthy; Canon Tristram remarks (*loc. cit.*), "In spite of the amazing abundance of fish in the Lake of Galilee, we never noticed this bird there, probably because of the absence of suitable cover." In other places it was always common in winter and in spring, and on the lagoons near the mouth of the Kishon it was to be seen perched on the naked stumps projecting from the water, a similar habit to that which I have observed in the north of Ceylon. It does not appear to be very common in Spain. Lord Lilford says that it is found about Valencia; and Mr. H. Saunders discovered it nesting in May on a crag, 700 feet above the sea, on the island of Dragonera. In Corsica and Sardinia it is more often met with in winter than in summer. It inhabits the extreme north of Europe, and breeds as high as Archangel, near which Messrs. H. Brown and Alston observed one of its eyries on the top of a gigantic blasted pine. It used to be a common bird in the British isles; but the constant robbery of its eyries has in the end tended effectually to drive it from its accustomed haunts. It still breeds in a secluded spot in Invernessshire, is occasionally met with in different places round our coasts, and now and then pays unexpected visits to some of our inland waters—an account of one of which to the large reservoirs of the Paddington Canal, in Bucks, is given in 'The Ibis' for 1865, by the Rev. H. Crewe.

Turning to the New World, we find it recorded from many parts of the northern portion of the continent, both on the seaboard and far inland, from many parts of the States, from Honduras, from the Antilles, and from the northern parts of S. America. In Africa it is not so plentiful. Captain Shelley found it frequenting the rocks on the banks of the Nile. Mr. Taylor met with it commonly in Egypt, and Mr. Drake did the same in Tangiers. Finsch and Hartlaub record it from the eastern parts of the continent, and Layard from South Africa. Governor Ussher, however, did not procure it on the Gold Coast, and it is, no doubt, less common on the western side of the continent than on the eastern. It is found throughout the northern parts of Asia, down the eastern coasts to Formosa, and occurs in Central Asia from Siberia to the Himalayas, which brings us to the closer consideration of its distribution in India, in which empire it is, during the cold season, as common as anywhere in the world. Jerdon remarks, "It is spread over all India, most abundant, of course, along the coast, where there are numerous backwaters and lagoons, but common along all the large rivers, and generally found at most of the larger lakes and tanks, even far inland." Mr. Hume, in his 'Rough Notes,' says, "The Osprey is found throughout the lower ranges of the Himalayas in the rocky gorges of all the larger streams, and along the course of the Ganges and the Jumna from their mouths almost to their sources. I have, from time to time, observed it in Cawnpoor, Etawah, Agra, and Allyghur districts. I met with it also on the Sutledge, at the Sambhur Lake, and the Nugjufgurh jheel; and I recently shot a very fine one close to Saharunpoor, on the western Jumna canal." He likewise found it, though not in any considerable numbers, on the Indus and larger sheets of water in Sindh; but on the coast, particularly in Kurrachee harbour, it was much more common. From these remarks it will appear evident that the Osprey is well distributed throughout northern India; but in the southern part it is apparently chiefly confined to the sea-coast; it is common enough at Ramisserum Island, and I have no doubt is equally so on both coasts of the peninsula; but I find no record of its having been noticed of late years in the inland districts. On the opposite side of the Bay of Bengal it

is rare. It is not mentioned in Mr. Armstrong's list of the birds of the Irrawaddy delta; it is a scarce winter visitor in Tenasserim, and has not been noticed at all in the Andaman Islands. It has not been observed in either Sumatra, Java, or Borneo, and to the south-east is replaced by the closely allied but smaller Australian species, *P. leucocephalus.*

Habits.—In Ceylon the Osprey frequents the sea-coast, salt lagoons, the estuaries of rivers, and land-locked brackish lakes; but in the several continents of the globe is also found on great rivers throughout their course and on large freshwater lakes. It feeds entirely on fish, and is a most persevering fisher and skilful captor of its finny prey. Its mode of precipitating itself headlong from a great height, with an almost unerring aim, sometimes even disappearing under water in the force of its downward plunge, and emerging with its well-caught prey, has been the admiration of all lovers of nature acquainted with this fine bird. It seizes with its talons, suddenly darting out its legs as it reaches the surface, and doubtless, when striking at a fish swimming somewhat beneath the surface, having thrown all its strength into the effort and acquired its maximum amount of momentum, it is unable to check its progress, and consequently disappears for a moment. The fact of its using its talons in taking its prey militates against all capability of pursuing it under water; and although an instance has been known, as cited by Professor Newton at page 31 of his edition of 'Yarrell's British Birds,' of an Osprey having been caught in a fishing-net, it is evident that this must have been spread just beneath or, more probably, on the surface of the water. When flying about not in search of food, the Osprey proceeds at a moderate speed with tolerably quick and regular beatings of its long wings, and does not exhibit any great powers of flight. When in pursuit of fish, however, its actions are very different. On one occasion, near Trincomalie, I was startled, while intent on getting within shot of some Turnstones, by a booming noise above my head, and on looking up perceived an Osprey on its headlong course into the lagoon; launching out its legs, it dashed into the water, throwing up a quantity of spray, and immediately rose again, appearing to have missed its aim. Sir John Richardson remarks that should the fish have moved to too great a depth, it "not unfrequently stops suddenly in its descent, and hovers for a few seconds in the air like a Kite or Kestrel, suspending itself in the same spot by a quick flapping of its wings." I have seen it soaring at a considerable height, and could always recognize it at a distance from the Sea-Eagle in Ceylon by its long wings and quickly-performed circling; on descending again, it would often perch on the top of a dead tree, or make off to its favourite perch, the "guide-posts" of the channels in the shoal waters of the Jaffna peninsula. On such posts in the Paumben channel it may also be seen perched on any day in the cool season. At Manaar it roosts on the tops of dead and denuded palmyra trunks, coming to the same spot every evening some time before sundown, and flying about the palm-grove until dark. The reversible outer toe, which is so peculiar in the Osprey, and which exists to a limited extent in the Fish-Eagle, is no doubt a provision of nature to enable these birds, by an onward stroke, to strike or "rake" into the flesh of their quarry with their powerful hind claws, while with the anterior claws they clutch the fish which has been struck. It is stated that the Sea-Eagle (*Haliaetus leucogaster*) frequently robs it of its prey, pursuing it until it lets fall its well-earned prize, when the robber Eagle swoops down and bears it away.

Nidification.—In the opinion of many ornithologists, the Osprey breeds within the Indian limits; but I am not aware that its eggs have been taken south of the Himalayas. Mr. Hume has seen its nest in Kumaon, and Mr. Thompson believes it to breed on the Ganges above Hurdwar. Dr. Jerdon says, in his 'Birds of India,' that it breeds "in this country on trees;" but he does not seem to have procured its eggs. Elsewhere, in Europe, America, and Africa, its nest has frequently been found, examined, and described by naturalists. Mr. Wilson, writing of it in America, says that it is "externally made of large sticks, from half an inch to an inch and a half in diameter, and two or three in length, piled to the height of four or five feet, and from two to three feet in breadth; these were intermixed with corn-stalks, seaweed, pieces of turf in large quantities, and lined with dry sea-grass, the whole forming a mass observable at half a mile distance, and large enough to fill a cart, and formed no inconsiderable load for a horse." These materials are so well put together as often to adhere in large fragments after being blown down by the wind. During the time the female is sitting, the male frequently supplies her with fish, though she occasionally takes a short circuit to the sea herself, but quickly returns again. The Fish-Hawk lays in April, May, and June in northern climes. The number of

eggs is nearly always three. Mr. Dresser remarks that in a large series he has found most of the eggs to be white, richly spotted and blotched with deep chestnut-red, and sparingly marked with a few purplish-grey underlying blurs or markings; in one or two the deep red blotches were so close as almost to hide the ground-colour.

The specimen figured in Hewitson's 'British Birds' Eggs,' pl. iii., has the larger markings in the form of softened clouds of brownish red in a zone round the large end, while the rest of the surface of the shell is tolerably profusely covered with linear blotches of a paler hue. The average dimensions are 2·5 inches by 1·9. The singular fact is recorded by Wilson, that "the most thriving tree will die in a few years after being taken possession of by the Fish-Hawk;" and he remarks that this is attributed to the fish-oil and to the excrement of birds, but is more probably occasioned by the large heap of wet salt materials of which the nest is composed. The Osprey, if it really does remain all the year round in the island of Manaar, may perhaps breed on some of the gigantic Baobab-trees (*Adansonia digitata*) which are common there, and supposed to have been introduced by Arabs centuries ago.

Suborder STRIGES.

Outer toe reversible. Eyes directed forwards and encircled by a facial disk. Nostrils generally hidden by stiff bristles. Plumage soft and fluffy. Tibia more than double the length of tarsus. Tail with twelve feathers. (*Sharpe*, Cat. B. ii. p. 1.)

Fam. BUBONIDÆ.

Hinder margin of sternum always deeply cleft, two or more notches being present; furcula free; inner margin of middle claw not serrated. (*Sharpe*, Cat. Birds, ii. p. 1.)

Subfam. BUBONINÆ.

Head usually furnished with two large tufts at the sides of the forehead; facial disk imperfectly developed above the eye; ear-conch small and without an operculum. Tarsus stout, nearly always feathered.

ACCIPITRES.

STRIGES.

BUBONIDÆ.

BUBONINÆ.

Genus KETUPA.

Disk undeveloped above the eye. Bill very powerful. Nostrils oval, situated at the anterior margin of the cere, and covered by the long loral bristles. Head very large, and furnished with two long ear-tufts. Wings ample, falling considerably short of the tail; the 5th quill the longest, the 3rd and 4th slightly shorter. Tail moderate. Legs and feet very powerful. Tarsus longer than the anterior toes, feathered in front slightly below the knee, the rest bare and the toes finely reticulate. Claws stout, rather straight, the inner anterior one only trenchant beneath; soles furnished with fine spicules.

KETUPA CEYLONENSIS.

(THE BROWN FISH-OWL.)

Strix ceylonensis, Gm. S. N. i. p. 287 (1788).

Strix leschenaulti, Temm. Pl. Col. ii. pl. 20 (1824).

Scops leschenaulti, Steph. Gen. Zool. xiii. pt. 2, p. 571 (1825).

Scops ceylonensis, Steph. *l. c.* p. 54.

Strix hardwickii, J. E. Gray, Ill. Ind. Zool. ii. pl. 31.

Cultrunguis nigripes, Hodgs. J. A. S. B. v. p. 364.

Cultrunguis leschenaulti, Jerd. Madr. Journ. x. p. 90.

Ketupa ceylonensis, Gray, Gen. B. i. p. 38 (1845); Blyth, Cat. B. Mus. A. S. B. p. 37 (1849); Kelaart, Prodromus, Cat. p. 116 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 107; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 77 (1854); Jerdon, B. of Ind. i. p. 133 (1862); Tristram, Ibis, 1865, p. 261; Hume, Rough Notes, p. 379 (1870); Swinhoe, P. Z. S. 1871, p. 343; Holdsworth, P. Z. S. 1872, p. 417; Hume, Nests and Eggs, p. 64 (1873); id. Stray Feath. 1873, p. 431; Legge, Ibis, 1874, p. 11; Ball, Str. Feath. 1874, p. 382; Hume, ibid. 1875, p. 38; Legge, ibid. 1875, p. 198, id. Ibis, 1875, p. 279; Sharpe, Cat. B. ii. p. 4 (1875); Armstrong, Str. Feath. 1876, p. 300; Inglis, ibid. 1877, p. 16.

Great Ceylonese Owl, Brown, Ill. Zool. pl. 4; *Ceylon Eared Owl*, Latham, Gen. Syn. i. p. 120; *Great Brown Owl*, *Great Horned Owl*, Europeans in Ceylon.

Amrai-Ka-ghughu, *Ulu*, Hind.; *Utum*, Beng.; *Teedook*, Arracan.

Bakamūna, Sinhalese, lit. "Fish-Owl"; *Anda*, Ceylon Tamils; *Oomuttanloovey*, Tamil (*apud* Layard).

Adult male and female. Length to front of cere 19·5 to 20·0 inches; culmen from cere 1·4 to 1·65; wing 14·5 to 15·8, expanse 51·0 to 54·3; tail 7·0 to 8·0; tarsus 2·5 to 2·8; mid or outer anterior toe 1·5 to 1·85, claw (straight) 0·6 to 0·85; height of bill at cere 0·5 to 0·67.

The above measurements are taken from a series of seven Ceylonese examples. Specimens of both sexes vary in size *inter se*; but males appear to be as a rule the larger of the two. Three males measure in the wing 15·3, 15·9, 14·5; four females 14·4, 14·5, 15·0, 14·5. In the size of tarsus, foot, and bill there is not the same preponderance in favour of the males.

Iris fine clear golden yellow; cere dark olivaceous green; bill olivaceous green, in some greyish green; a dark brownish-green patch on the sides of the mandible; under mandible usually paler than the upper; tarsi and feet olivaceous greenish, the skin between the reticulations yellowish; in some examples the entire tarsus is yellowish, with the joints and toes greenish.

Above light vinaceous brown, darkest on the interscapular region and upper scapulars, and palest on the rump and upper tail-coverts; the feathers of the head, sides and back of neck with broad mesial streaks, increasing on the back and scapulars to drop-shaped patches of dark brown; the light portions of the hind-neck feathers cross-rayed with brown; shorter lateral scapulars with white outer webs and dark shaft-stripes; wing-coverts dark brown, the lesser series edged with light tawny; the greater zone of secondary coverts crossed with interrupted bars of fulvous whitish; the outer feathers of this and the series above it with large white patches at the tips of the outer webs; the inner feathers, as well as the tertials and longer scapulars, pale at the outer edges and tipped and mottled in a bar-like form with buff; primary-coverts, primaries, and secondaries dark brown, barred and tipped with dusky buff, paling to white on the outer webs of the longer primaries, and subdued with a brownish hue on the inner webs of all the quill-feathers; basal portion of the inner webs white; rump and upper tail-coverts with narrow mesial brown lines, the feathers faintly edged with fulvous; tail concolorous with the secondaries, and tipped and crossed with four bars of dusky buff, paling to whitish at the base of the inner webs of the lateral feathers; face tawny brownish, the base of the loral plumes white and the terminal portion of the shafts black; an orbital fringe of bristly blackish feathers; ear-tufts concolorous with the crown.

The feathers of the lower cheeks and at the side of the throat with narrow dark shaft-lines; throat more or less white (in some more than in others), with narrow shaft-stripes of brown; breast, flanks, and under surface delicate fawn-colour, darkest on the upper breast, and paling considerably in some on the belly and longer thigh-plumes; each feather with a deep-brown lanceolate shaft-stripe, and crossed with fine, wavy, brown rays, which are more conspicuous on the lower parts than on the breast; thighs pale tawny, unmarked; under tail-coverts lightly striped; lesser under wing-coverts fulvous tawny, with dark brown shaft-stripes widening at the tips; greater series white at the base, with the terminal portion blackish brown; white basal portions of the primaries tinged with yellow, as also the under surface of the adjacent bars.

Obs. The white throat-patch varies in size independently of the general light or dark hue of the under surface, specimens which have markedly fulvous breasts having the white gorge as large as any other. This, then, being a variable character is (although such has been maintained) of no value whatever as a distinguishing feature in the Ceylonese birds from any others. The latter are, however, as a rule smaller than some North-Indian and Burmese specimens; but this is a *constant character* of Ceylonese representatives of Indian species. That the Brown Fish-Owl varies in size in India will be seen from the following measurements:—Three males, wing 15·0 to 15·7 inches, three females 16·5 to 18·0 (*Hume*, 'Rough Notes'); two males, wing 16·2 and 16·0 (Chota Nagpur, *Ball*); several females 14·9 to 15·7 (Irrawaddy delta, *Armstrong*); one female 15·6 (Burmah), and two examples unsexed, 15·3 and 14·8 (Burmah and N. Bengal; measured by myself in British Museum). Two of these last three coincide exactly with Ceylonese specimens in general hue, white throat-patch, and transverse breast-striations; the third presents an individual peculiarity in its very rufescent character throughout, and almost total absence of chest-striations like *K. flavipes*. Lastly, a Cochin-China example in the national collection is quite similar to those from Ceylon.

Distribution.—This Fish-Owl is very generally diffused throughout the low country, where localities suitable to its habits occur; but it does not appear to ascend much above the level of the deep valleys of the Kandyan Province. In the western and southern portions of the island it is found near the banks of all the large rivers, and very often about wet paddy-fields; but it is not so numerous in that division as on the eastern side or in the forests of the northern half, where its chief haunts are the borders of all the inland tanks, both large and small, and the forest-lining of the large rivers. It is found on the sea-coast where the jungle clothes the actual shore, as it does round the magnificent harbour of Trincomalie and at many other localities. In the Seven Korales it is very abundant; I have met with it there, in every sort of locality, from the

insignificant water-hole ornamented with a solitary banyan, to its favourite haunt the huge Koombook-tree spreading its massive arms over the dried-up, sandy river-bed.

In the Kandyan Province it follows the banks of the Mahawelliganga from the low country into the valley of Dumbara, being a well-known bird about Peradeniya, and occurs in the valley of this river, as well as in those of its affluents up to about 3000 feet. Mr. Laurie has procured it in Kalebokka, about the same elevation, and it is likewise found in the Badulla district. In the southern ranges I have met with it up to 2000 feet, and I have no doubt it occurs generally, though not in any numbers, throughout that hill-district.

Elsewhere the Brown Fish-Owl is found throughout India in suitable spots, from the Himalayas to the extreme south, ranging into Assam, Arakan, and Burmah, as far south as the province of Tenasserim, beyond which it ceases to extend, being replaced in the Malayan peninsula by the smaller species *K. javanensis*, which likewise inhabits the Burmese kingdom. Concerning the Irrawaddy-delta district, Mr. Armstrong writes that this Owl is tolerably abundant in the thin forest-jungle surrounding the jheels between Elephant Point and China-Baker. In Cachar, Mr. Inglis records it as rather common; and about Thayetmyo and Tonghoo, Messrs. Feilden and Oates remark that it is also common. From Chota Nagpur Mr. Ball records it, and Mr. Fairbank from the Sahyadri mountains. Jerdon says that it is found in the Nilghiris to a considerable elevation, being not rare in Otacamund. Mr. Fairbank likewise has it from the Palani hills, although it has not yet been procured in the Travancore range. It does not appear to be found either in the Deccan or in Sindh. Beyond the limits of the Indian region Mr. Swinhoe has procured it near Hongkong; and in an equally remote locality to the west, viz. Palestine, Canon Tristram has found it. Its occurrence in these widely distant places is very remarkable. As regards the Holy Land, Canon Tristram writes, in 'The Ibis' for 1865, "We can only point to one locality as the certain residence of this bird in Palestine." It "was found by us in the wild wooded glen of Wady el Kurn, running up from the Plain of Acre. We discovered it accidentally, and at first took it for the *Bubo ascalaphus*, when it bolted out of the dense foliage of a great Carob-tree under which we were standing; we thus put up no less than four individuals in two days."

Habits.—This large Owl loves the vicinity of water, haunting the banks of rivers, tanks, inland salt lagoons, the borders of sea-bays, and woods surrounding rice-fields. All who have visited the tanks in the north and east of Ceylon must be familiar with this fine bird, which is so often surprised napping in the lofty trees growing on the embankments or so-called "bunds." Its powers of vision in the day are not quick, but they are tolerably clear; on hearing the footsteps of man, it raises its large ear-tufts, and, bending down its head, stares stolidly down from its lofty perch among the green boughs, and as soon as it becomes aware of the nature of the intruder on its retreat, hastily launches itself out of the tree, and is not easily approached a second time. It is much more common in wild forest country combined with water than in cultivated districts. It sallies out in the evening with great regularity. As soon as the sun begins to sink behind the surrounding forest, it may be noticed, flapping noiselessly round some secluded cheena, or leisurely crossing the lonely tank, resounding at the hour of sunset with the booming of innumerable frogs, to the nearest conspicuous tree, and there gives out its sepulchral groan. This gloomy salutation is usually responded to by its mate, who perches close at hand, and answers by a double note, the two lonesome sounds resembling the words *gloom, oh-gloom*. At night I have often heard these notes repeated by a pair without intermission for many minutes. Layard remarks that when alarmed during the day they utter a loud hiss, subsiding into a growl. They appear to have an accustomed place of roosting, for Mr. Holdsworth notices that they "perched day after day on the same branch." This is very often in an exposed situation, and it frequently falls to their lot to be mobbed by a flock of garrulous Bulbuls, King-Crows, and other Owl-hating small birds. Fish is the favourite food, and, in fact, the usual diet of this species; but when this is not procurable, small mammals, reptiles, and even insects are devoured by them. In the stomach of one example I found a snake (*Haplocercus ceylonensis*) and some large beetles. As a proof of their miscellaneous diet, and also of their voracity, I may mention that a pair of Fish-Owls which were kept by Sir Charles Layard in the same aviary with a Brahminy Kite, fell one night upon their luckless companion, and, after slaughtering him, forthwith proceeded to devour him completely. Further, Mr. Hume records, in 'Nests and Eggs,' finding the remains of quails, doves, and mynahs in the nest of a pair on the Jumna; and in 'Stray Feathers,' vol. v. p. 16, Mr. J. Inglis writes as

follows concerning the food of this species :—"I once surprised a pair of them feeding on the carcase of an alligator which I had shot a few days previously."

Nidification.—In Ceylon the Fish-Owl breeds from February until May. It nests in hollow trees or in crevices in rocks near water. The nest is scanty, consisting of a few sticks, and when placed in holes of trees of nothing but the bare wood or, perhaps, a few leaves. The eggs are usually two in number, broad ovals in shape, tolerably glossy in texture, and pure white. Two that I examined from the Kurunegala district measured 2·29 by 1·72 and 2·3 by 1·78 inch.

In India this Owl sometimes tenants the deserted nest of a Fishing-Eagle, carefully lining it with grass and feathers, and occasionally constructs its own nest in the recess of a large upright fork.

Genus BUBO.

Head and disk much as in the last; bill slightly longer; nostrils more oval; ear-conch rather small. Wings moderately short; 4th and 5th quills subequal and longest, and falling short of the tail by more than the length of the middle toe. Tail moderate, even. Tarsus rather short, very stout, and feathered down to the foot. Feet very large; inner toe subequal with the middle one, the outer very short; inner claw very large and long.

BUBO NIPALENSIS.

(THE FOREST EAGLE-OWL.)

Bubo nipalensis, Hodgs. As. Res. xix. p. 172; Sharpe, Cat. B. ii. p. 37 (1875).

Huhua nipalensis, Hodgs. J. A. S. B. vi. p. 362; Jerd. B. of Ind. i. p. 131; Blyth, Ibis, 1866, p. 254; Jerd. Ibis, 1871, p. 346; Blyth, Ibis, 1872, p. 89; Hume, Rough Notes, p. 378 (1873); id. Str. Feath. 1873, p. 431, and 1874, p. 468.

Etoglaux nipalensis, Hodgs. J. A. S. B. x. p. 28.

Bubo orientalis, Blyth, Cat. B. Mus. A. S. B. p. 34 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. no. 80 (in part), p. 72 (1854).

Ptiloskelos amhersti, Tickell, J. A. S. B. xxviii. (1859) p. 448; id. MS. Ill. Ind. Orn. vol. ii.

Huhua pectoralis, Holdsw. P. Z. S. 1872, p. 416.

Huhu, Huhu chil, Nepalese (*apud* Hodgson).

Loko Bakamūna, Sinhalese; *Peria-anda*, Tamils in Ceylon.

Adult female. Length to front of cere 23·0 to 24·0 inches; culmen from cere 1·7 to 1·9; tail 8·3 to 9·5; tarsus 2·75; mid toe 2·0, claw (straight) 1·75; height of bill at cere 0·8. Expanse of one with a wing of 17·2, 56 inches.

Male. Wing 15·3 to 17·0 inches.

The following are individual measurements of a series of seven examples:—

	Wing. in.	Tail. in.	Tarsus. in.	Weight.	Museum or Collection.
♀. Kalebokka	18·0	8·3	2·75	....	T. Butler, Esq., Clapton.
♀. Haputale	17·2	9·5	2·75	3·75 lb.	Norwich.
♀?. Kandy district	17·2	9·2	2·50	....	Norwich.
Juv. ♂. Kandy district	17·0	8·5	2·50	....	Colombo.
♂. Maskeliya	16·0	7·4	2·50	....	R. Cobbold, Esq., Ardleigh.
♂?. Kandy district	16·2	8·1	2·50	....	British Museum.
♂. Kandy district	15·3	....	....	....	E. Holdsworth, Esq.

Iris "yellowish brown" (*Bligh*, in epist.); bill olivaceous brown; cere olive; feet brownish, claws dark brownish horn.

Forehead, crown, and all above glossy sepia-brown, barred on the head and hind neck with narrow cross rays of fulvescent white, and on the back, scapulars, and wing-coverts with broader bars of buffy, including a terminal band of the same, which, on the longer scapulars and greater wing-coverts, is mottled with brown; inner webs of ear-tufts (which vary from 2·5 to 3·0 inches in length) barred with buff-white; outer webs of the lateral scapulars buff, the inner barred with mottled bands of a paler hue; outer webs of the anterior wing-coverts conspicuously banded with buff; primary-coverts crossed with pale mottled bars, duskier on the inner webs; primaries and

secondaries banded with smoky grey across both webs, the inner paling to buff at the edges; tail deeply tipped and crossed with fine narrow mottled bars of dusky buff; these widen and are paler towards the base.

Lores and facial disk greyish; chin, throat, and under surface whitish, washed here and there on the breast with buff; chin and ruff-feathers barred narrowly with brown; fore neck and chest banded with regular bars of the same, the distance between which increases on the upper breast; on the breast, pectoral plumes, flanks, and under tail-coverts the bars increase in width, take a pointed or slightly spear-shaped form, and are very far apart, but are three in number, as on the chest; bars of the under tail-coverts paler and narrower than those of the breast; tarsi narrowly barred with brown; under wing-coverts buffy white, marked with bar-like spots and pointed bars of brown.

Obs. The above is a description of the largest and most mature bird* I have met with. One, probably in the plumage of the second year, has the barrings of the upper surface more buff and generally broader, the markings of the head and hind neck, especially, showing a more yellow hue than in the old bird; the scapulars have more of the buff hue on the inner webs, the markings of the wing-coverts and barring of the tail show the same characteristic; the bands on the throat and round the edge of the disk are more coalescent, those on the chest closer together, and there is a more sudden increase in the width of the interspaces on the breast than in the above example; tarsi not so strongly barred.

Young. The nestling has the iris brown; bill fleshy white; feet dull yellowish, claws dusky.

Above and beneath white; the head and hind neck narrowly barred with brown; the back, scapulars, and wing-coverts openly banded with the same and tinged with rufescent buff, the edges of the bars whitish, contrasted with the buff ground-colour; quills dark brown, with handsomely mottled bars of smoky grey; tertials whitish, barred similarly to the scapulars; forehead and disk white; orbital fringe dark; tail smoky grey, banded with blackish brown; beneath, the under surface is tinged with greyish, and marked throughout with narrow, wavy, blackish-grey cross bars; legs white, unbarred.

Bird of the year. After putting off the nestling dress, the bill becomes more olivaceous; the upper surface is light glossy sepia-brown, with all the pale markings bolder and yellower than in the adult; the bars on the head, hind neck, shoulder of the wing, and least wing-coverts are greyish buff; on the scapulars and greater secondary wing-coverts they are rich buff, broad and mottled conspicuously with brown; primaries and secondaries tipped and barred with pale brownish, paling on the inner webs into brownish buff; basal portion of primaries buff; tail brown, tipped deeply and banded with four bars of buff, mottled with the ground-colour.

Lores, face, and ear-coverts greyish, the former with blackish shaft-lines, and the latter with indistinct cross lines of brown; fore neck and sides of throat whitish, changing on the breast and under surface into buffy white; ruff and neck as far as the centre of the chest barred with brown more closely than in the adult, on the breast the space between the bars increases gradually to the lower parts, and on the flanks and pectoral plumes the markings are pointed; legs barred narrowly with undefined marks of brownish; under wing-coverts buff, barred like the under surface.

Obs. The distinctive characteristic of the immature bird is the difference in width of the chest and breast interspaces, giving the appearance to a casual observer of a coalescence on the former region. Whether this character or not led to the distinctive name *pectoralis* of Jerdon for the South-Indian bird I am unable to say; it is common to nearly all Ceylonese young birds, the only exception to the rule that I know of being that of the young male (?) in the collection of Mr. Holdsworth. The ground-colour of the under surface in this is more fulvescent than in other birds which have come under my notice; the bars are not spear-shaped on the lower parts, and approach gradually from there up to the chest, where they are very close together. Mr. Hume observes ('Stray Feathers,' vol. i. p. 431) that the markings on the chest are variable in Himalayan birds also.

As regards the supposed distinctness of the Nepaul form from the Ceylonese, after giving considerable time and attention to the subject, and examining the specimens of the former in the British and Norwich Museums, I must support Mr. Hume in considering them identical. Ceylonese birds are, doubtless, as a rule smaller than northern; and guided by this, together with the peculiar feature exhibited in the widely-separated pointed bars of the lower parts, I was disposed for some time to follow Mr. Holdsworth in diagnosing them as *H. pectoralis*; but the fact of the old birds, such as the fine example shot by Mr. Laurie, and two others which I have seen in Messrs. Whyte and Co.'s establishment, coinciding exactly with Himalayan examples, settles the matter, I think, beyond dispute. In such the character of the under-surface barring, the coloration of the scapulars, and even the diminishing of

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* In the possession of Mr. T. Butler, Knighton House, Clapton; shot by Mr. Forbes Laurie in Kalebokka.

the transverse markings of the head to marginal indentations are precisely similar to the like conditions in the Himalayan bird. Should further investigation, aided by the examination of a larger number of *fully* adult birds than I have been able to get together, lead to the discrimination of the insular race as altogether a smaller one than the North-Indian, I would propose the specific name of *blighi* for the former, as Mr. Bligh was, I believe, the first to procure, or, at any rate, to bring to the notice of ornithologists, the species in Ceylon. An inspection of Jerdon's figure of *H. pectoralis* in the 'Madras Journal,' 1839, vol. x., and a perusal of the description in the text of the lower plumage, does not strengthen the conviction of its identity with the Ceylon bird. The drawing shows a band across the chest, formed by a brownish *ground*-colour, and not by a coalescing of the bars, such as is never seen in the youngest of Ceylonese specimens. The description (p. 89) is in part as follows:—"Beneath white, feathers barred with brown, numerously on the throat, less so on the belly and vent, and the bars are larger and take an arrow-headed form; *a narrow pectoral band of brown with a golden tinge, and edged buff as above.*" The latter characteristic is not represented in Ceylon specimens, and reads as if it had been an abnormal one in Jerdon's bird. With regard to the superior size of Himalayan *nipalensis*, 3 adult examples in the British and Norwich Museums, irrespective of sex (which is not recorded on the labels), measure in the wing 17·5, 18·0, and 18·2 inches. In the Norwich example there is an extra bar on the feathers of the lower surface, which peculiarity likewise exists in Mr. Laurie's bird, described above.

Distribution.—This splendid Owl, the largest and most powerful of its tribe in Ceylon, is a pretty general inhabitant of the mountain-region of the island from about the level of the Dumbara valley to the upper ranges. I have never met with any examples of it from the southern coffee-districts, but have no doubt that it occurs there, and that it may have not unfrequently been killed on the estates in that part of the island. In the Kandyan Province it has been procured in the districts of Matale, Kalebokka, Dumbara, Pusselawa, Maskeliya, and Haputale. It is, however, a comparatively recent addition to the avifauna of Ceylon, having been added to the list of birds by Mr. Holdsworth in his catalogue dated 1872. The specimens brought under his notice were procured by Mr. S. Bligh in 1867 in the Kandyan district; and this gentleman has therefore the credit of discovering this fine addition to the Ceylon Strigidæ. Among the several fine examples which have been procured since Mr. Bligh's first specimens are a female in magnificent plumage shot by Mr. Forbes Laurie in Kalebokka, an equally fine bird killed by Mr. C. Cobbold in Maskeliya, an adult female procured by Mr. Bligh at Lemastota, and a male killed by coolies on his estate at Catton, in addition to all which not a few specimens have found their way to the establishment of Messrs. Whyte and Co. in Kandy. An immature example from this source is now in the Colombo Museum, and another in the British Museum. I have no information of this species having ever been shot in the low country; but doubtless on more extended research it will be found tolerably low down in the Peak forests, and I should not be at all surprised to see it occur in the ranges just above Gillymally. Elsewhere the Eagle-Owl is found in the Himalayas and the Nilghiris (if Jerdon's *pectoralis* should prove not to be a good species). Eastward of India proper it ranges into Tenasserim.

Habits.—This fine bird, as its English name implies, is a denizen of woods and forests; in Ceylon, however, it is, on the whole, more partial to isolated patna-woods than to the gloomy interior of the large jungles, and is doubtless attracted thither by the abundance of bird-life in these cool and retired ravines. It is usually found roosting in shady trees in the most confined portions of patna-dells, down which sparkling streams tumble, shut in by steep wooded banks. Should its retreat, as is often the case, border a coffee-estate, the Eagle-Owl levies contributions on the pigeons and poultry of the neighbouring bungalow, and falls a victim to the gun of the *Doré*. In such manner one of the above-mentioned examples was killed from the roof of his house by Mr. Cobbold in Maskeliya, after it had, as I am informed, decreased the population of the adjoining dove-cot. It is said to feed principally on birds, and very likely also preys on the large squirrels (*Sciurus tennantii*) common in the hill-jungles, occasionally perhaps killing hares, which are plentiful on most of the patnas in the Central Province.

In the Himalayas Hodgson asserts that it kills pheasants, and sometimes fawns of the smaller species of deer. Its exceedingly powerful talons and massive legs would certainly enable it to capture as large animals as most Eagles. I believe it to be strictly nocturnal in its habits; and Doctor L. Holden, formerly of Deltota, who observed something of its habits, informed me that it was very shy, quickly taking flight in the day when

its haunts were invaded. The note of *H. pectoralis* is said by Jerdon to be a "low, deep, and far-sounding moaning hoot," and most probably resembles that of the present species. The vocal powers of the latter are, however, not restricted to a hoot; for Major Fitzgerald, R.A., in writing to Mr. Gurney in November last, and as quoted in 'The Ibis' (January 1878) by the latter gentleman, remarks of a caged bird that he had kept for years:—"In confinement the bird became quite tame, and would utter cries of pleasure at recognizing the hand that fed it. . . . . . . It was, I think, a female; and during the period which might probably be its nesting-season, was in the habit of uttering a peculiar and incessant cry."

Nothing is known of the nidification of this species. It probably builds a stick-nest in the hollow of some large trunk, or on a deep and capacious fork between two limbs overshadowed by thick foliage, or perhaps it may deposit its two eggs in holes in large trees, merely on the rotten wood generally found at the bottom of the cavity. I commend the subject to my ornithological friends in Maskeliya, Haputale, and other likely districts in the Ceylon hills. A knowledge of this bird's breeding-habits would be a grand acquisition to the ornithology of the island.

Genus SCOPS.

Of small size. Cere prominent, the nostrils oval and pierced in the anterior margin; margin of the bill curved throughout. Ear-tufts large. Wings long and ample, reaching to the tip of the tail in some; the 4th quill the longest, 3rd and 5th slightly shorter. Tail moderately short and rounded at the tip. Tarsus long, nearly always feathered to the foot. Toes generally naked, the anterior toes subequal; the inner posterior toe rather short, finely reticulate except at the tips, which are covered with two or three transverse scutes; claws well curved and acute.

SCOPS BAKKAMUNA.

(FORSTER'S SCOPS OWL.)

Strix bakkamuna, Forster, Indische Zoologie, 1781, p. 13, pl. iii.; Lath. Ind. Orn. i. p. 56 (1790).

Otus indica, Gm. S. N. i. p. 289 (1788).

Scops griseus, Jerd. Madr. Journ. xiii. pt. 2, p. 119.

Ephialtes lempigi, Kelaart, Prodromus, Cat. p. 116 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 106; Jerdon, B. of India, i. p. 138 (1862); Legge, Ibis, 1874, p. 11.

Ephialtes bakkamuna, Holdsworth, P. Z. S. 1872, p. 417; Hume, Str. Feath. 1873, p. 433; Legge, J. A. S. (C. Branch), 1874, p. 17; Ibis, 1875, p. 279.

Scops bakkamuna, Hume, Nests and Eggs, p. 69 (1873).

Scops malabaricus, Sharpe, Cat. Birds, vol. ii. p. 94 (1875).

Die Horn-Eule Bakkamuna, Forster.

The Ceylon Hawk-Owl, also *The Little Horn Owl*, of Pennant; *The Little Eared Owl* of some; *The Lempigi Owl*, Kelaart; *Koorooi*, Portuguese in Ceylon (Layard).

Punchi-Bassa, Sinhalese, lit. "Small Owl;" *Sin-anda*, Tamil; *Motu* (*apud* Layard).

Adult male and female. Length 7·8 to 8·1 inches; culmen 0·6; wing (usually) 5·7 to 6·0, expanse 19·5 to 21·0; tail 2·5 to 2·7; tarsus 1·4 to 1·5; mid toe 0·65 to 0·8, claw (straight) 0·4 to 0·43; height of bill at cere 0·3 to 0·32.

A specimen in Layard's collection, now at Poole, measures 6·4 in the wing, and another in the British Museum 6·2; these are very exceptional dimensions. Between the sexes (that is, in Ceylonese examples, which alone are here treated of) there is no constant difference in size; two males in my collection measure 5·9 and 6·0 inches; three females 5·7, 5·8, and 6·0 inches. Examples from the Kandy district are, I think, as a rule, larger than low-country ones.

Iris reddish yellow, sometimes mottled externally with chestnut-brown, in others chestnut of various depths; cere olive-brown; bill greenish horn-colour, pale at the base and dark brown at the tip; feet brownish olive, in some greenish, soles sickly yellow, claws dusky pale at the base.

General hue of back, tail, wing-coverts, tertials, and secondaries earth-brown, with blackish-brown mesial stripes to the feathers, particularly on the back and scapulars, and both webs marked with transverse spots of dusky fulvous and

also mottled with brownish grey, on the secondary wing-coverts the fulvous or buffy markings are chiefly conspicuous on the outer webs; outer webs of external scapulars and a more or less defined collar across the hind neck rich buff, mottled with brown; crown, nape, hind neck, and ear-tufts rich blackish brown, more or less spotted with ochraceous; forehead, region above the eyes, and inner webs of ear-tuft feathers greyish buff, pencilled with brown; primaries darker brown than the secondaries, mottled with ochraceous grey at the tips, with a series of dark-edged fulvous or buffy white spots on the outer webs and corresponding palish bars on the inner; secondaries crossed with mottled bars of ochraceous grey, changing into buff at the inner edge; tail with 5 or 6 wavy mottled bands of the same; lores concolorous with the forehead, the terminal portions of the shafts black.

Facial plumes and cheeks buff-grey, crossed with dark pencillings; chin buff-white, unmarked; general hue of throat, chest, and under surface buff, richest on the chest, and paling to whitish on the abdomen and lower thigh-plumes; the feathers of the ruff boldly tipped with blackish; the throat and chest with fine transverse pencillings of brown; feathers of the breast, flanks, and sides of abdomen with clearly-defined blackish-brown shafts, branching off into cross vermiculations of ochraceous brown; thighs and upper part of tarsi more or less marked with brown, lower part almost unmarked, and in some examples the entire tarsus devoid of marking; under wing-coverts very variable in some, buff, unmarked, in others, tipped and spotted with sepia-brown; edge of the wing whitish buff.

Obs. The hue of the head and hind neck varies in depth; some examples, fully mature, have these parts but little darker than the back; it may, however, be laid down as a general rule that the oldest birds have the darkest heads, and this is usually accompanied by a richer tone in the buff markings of the upper surface and the ground-colour of the chest and flanks. Some birds have the breast-feathers crossed with yellowish-buff markings.

The large example above referred to as in the British Museum is very dark on the upper surface, and has the light markings but slightly tinged with buff; the under surface, which is conspicuous for its whitish ground-colour, has the breast-feathers very openly pencilled with transverse rays. Several examples which I have examined from the hill-districts are decidedly greyer in their light markings than low-country birds, and show an absence of the buff tinge on the breast, which is unusual in the latter.

Rufous varieties of this Owl are occasionally met with in Ceylon. A living specimen, which I had for some time at Galle, had the iris chestnut-brown, the bill fleshy brown with a dark tip; feet vinous brown. The portions of the upper surface which are buff and greyish in ordinary birds were rufous in this, and the under surface was also a rich rufescent buff.

Young. Iris in some brownish yellow, in others reddish yellow; bill dusky horn-colour, under mandible bluish; feet brownish grey. The iris darkens with age, and the bill loses its plumbeous tint, the bill and feet in yearlings resembling those of the adult, but slightly less olivaceous.

The nestling has the plumage fluffy and the upper surface whitish, closely and indistinctly barred with brownish, the amount of each colour being about equal; the head, however, is lighter than the back, being the reverse of the adult character; wing-coverts brown, with irregular buff markings, the brown hue pencilled with greyish, the greater wing-coverts darker than the rest; quills pale brown, crossed with wavy mottled bars of fulvous; the bars on the centre of the outer webs and those at the base of the inner webs unmottled; lores greyish, mottled with brown; beneath greyish white, entirely crossed closely with wavy lines.

A pair of nestlings from the same nest, which differed even in the colour of the irides, were clothed in this whitish garb. In other specimens the character of the plumage is buff or ochraceous. A bird of the year before me has the head, neck, chest, and breast buff-yellow, the crown and hind neck closely crossed with blackish; back and wing-coverts dark grey, much mottled with buff, the dark shaft-lines but little developed; lesser coverts dark brown, forming a dusky patch above the ulna; quills with the bars wider than in the adult, and the dark portions more mottled; tail as in the adult, the ground-colour towards the base not so dark; the face, throat, and fore neck with close transverse lines of brown. On the sides of the breast the adult dark-striped feathers are appearing; the abdomen and legs are whitish, and the under wing-coverts and edges of the wing are buffy white.

Obs. With regard to the specific name of this Owl, there can, I think, be no doubt that Forster's figure, in his 'Indische Zoologie,' refers to a Ceylonese bird, and is meant to illustrate his description in the text, notwithstanding that the drawing is not very like the original, and is given in a work which, though it professes to deal only with the ornithology of India, contains birds from other parts of the world. It is stated by the author that the Owl comes from Ceylon; and there is no other species in the island which could be meant to do duty for the present. In part the German description is as follows:—"Die Ringe von Federn um das Auge sind sehr hellgrau, und der äussere Ring bräunlich gelb. Der Rücken ist braun; die Brust ganz blass gelblich mit schwarzen pfeilförmigen Flecken besäet."

But that which clearly defines the Plate to be a representation of a Ceylonese bird is the faithful drawing of the well-known plant, the *Gloriosa superba*, which is depicted (not in conformity, however, with its nature) as entwining the dead tree on which the Owl is perched. In a footnote at p. 13 is contained a lengthy dissertation on the poisonous properties of the *Gloriosa superba* root, proving that Forster was dealing, both as regards bird and botany, with that which pertained to Ceylon.

Mr. Hume considers the Ceylon bird identical with the Indian species entitled *S. griseus* by Jerdon, and which is united with *S. malabaricus* of the same author by Mr. Sharpe.

Distribution.—This Scops Owl, which, next to the Fish-Owl, is the commonest of its family in Ceylon, is widely diffused throughout the island. It is, however, located more numerously in the western and southern portions than elsewhere, and wherever it is found is commoner near the sea-coast than in the interior. At Negombo, Colombo, and Galle, and the districts adjacent to these localities, it is, for an Owl, decidedly numerous. About the capital it is so common that it may be heard nightly, by those acquainted with its note, about the cocoanut-plantations in Colpetty and Slave Island, and even frequents the Fort. A little colony, which divided their quarters between the large trees in Queen's House Gardens and the old Suriah's which formerly stood in front of the new buildings in Chatham Street, several times came under my notice while I was stationed at Colombo. In the Fort of Galle it likewise frequented the most public places, being often seen in the rows of trees near the Master Attendant's house. Throughout the Galle district, as far inland as the Hinedun Pattu, it is common. In the South-east and Eastern Province it is less frequent, and further north, at Trincomalie, it is not at all common. Layard records it from the Jaffna peninsula, whence I have myself seen skins. Mr. Holdsworth found it at Aripu, in the Manaar district. In the lower hills about Kandy, and localities from there to about 3000 feet elevation, it occurs; but I do not think it has been noticed much above that height.

On the continent this species of Scops Owl inhabits various parts of the peninsula of India, being common in the south. It does not appear to extend eastward into Burmah and Malayana, where it is represented by the allied species *S. lempigi* of Horsfield. It is included by Captain Butler in his list of birds from the Mount Aboo district; but it does not appear to be found further south in the Khandala and Western Deccan region. In the northern parts of India it is abundant, according to Mr. Hume, who remarks, in 'Nests and Eggs,' "that it is widely distributed throughout the Punjaub, the North-western Provinces, Rajpootana, the Central Provinces, and Oudh." I observe, however, that Mr. Ball does not record it from Chota Nagpur, which province bounds the Central Provinces on the north-east.

Habits.—Forster's Scops Owl frequents cultivated country and the neighbourhood of towns and villages. It is found in the plantations of the natives, in their cocoanut-gardens, in low jungle, bamboo-thickets, and even in old buildings. About Colombo it is well known, being frequently heard from the verandahs of the Colpetty and Slave-Island bungalows uttering its monosyllabic note in the surrounding cocoanut-trees. In the country it takes refuge in thickets and low jungle, and is partial to the deep shade afforded by "bamboo cheena." In this latter it roosts on the horizontal branches of the "bataliya," beneath a thick canopy of tangled branches; while in the vicinity of human habitations it hides in holes of trees or in old buildings. It sleeps heavily, and has but limited powers of vision by day, for it may be approached within a few yards before perceiving that it is observed; when thus roused it flies off swiftly, quickly realighting, and turning round its head in the direction of its disturber, erects its ears and regards him with a fixed stare. It is by no means shy at nights, allowing itself to be shouted at when seated in a shady tree, uttering its monotonous *whok* note before taking flight. It usually frequents thickly-foliaged trees at night, about which it captures moths and beetles, taking them, according to Layard, on the wing. I have found its stomach to contain lizards as well as Coleoptera. It is strictly nocturnal in its habits, not issuing forth from its hiding-place before dusk, and it then resorts to the shade of thick trees and utters its monosyllabic note for some time. Layard says that this is changed "when flying to *wăh-hā wăh-hā*, quickly uttered and mingled with a tremulous cry." A pair of nestlings, referred to above, which I had for some little time displayed several interesting habits. They huddled together in one corner of their box, and when awakened during the day made a rapid stamping with their feet, consisting of some half a dozen blows delivered with such rapidity that there was no appreciable

duration of time between them. During the night, when hungry I presume, they made a snoring and hissing noise, and continued it for hours at a time. I have heard this note in the early evening in the *Hibiscus*-trees in the Galle Fort, and infer that it is the result of hunger. When looking at me, both this pair and the rufous bird already referred to oscillated their bodies to and fro, and moved their heads awry with the most comical aspect. They held their food in their talons, two toes in front and two behind, in the same manner as the Ceylon Wood-Owl, and after nibbling at it, paused, as if considering the expediency of the measure, and then quickly bolted it whole. Mr. S. Bligh had a tame bird at Kandy that would follow him round the room, alight on his shoulder, and nestle itself in his beard.

Forster's name for this Owl, as Mr. Holdsworth has shown in his catalogue, was ill-chosen; the term *Bakamūna* applies to the large Fish-Owl, signifying that it is a fish-eater, which the subject of this article certainly is not. I have, however, myself heard Ceylonese villagers, perhaps without thinking, apply the name *Bakamūna* instead of *Bassa* to the smaller Owls; and some such mistake probably led to Forster's adoption of the name.

Nidification.—In the southern parts of the island this Scops Owl breeds in February and March. It nests in hollow trees or in holes made by Woodpeckers in palms. A nest found at Oodogamma during my stay at Galle was placed in the hollow between the frond and the trunk of a Kitool-palm (*Caryota urens*). A few leaves or grass-stalks usually line the hole in which the eggs are deposited. These are from two to four in number, spherical in shape, and of a pure glossy white, and average, according to Mr. Hume, 1·25 inch in length by 1·05 inch in breadth. Mr. Blewit is mentioned by Mr. Hume as having found nests in holes of trees, which were lined with leaves and straw. The parent bird is said to fight vigorously when her retreat is invaded.

SCOPS SUNIA.

(THE RUFOUS SCOPS OWL.)

Scops sunia, Hodgs. As. Res. xix. p. 175; Blyth, J. A. S. B. xiv. p. 182; Jerd. Ill. Ind. Orn. pl. 41 (1847); Sharpe, Cat. B. ii. p. 67 (1875).

Ephialtes sunia, Gray, Cat. Mamm. &c. Nepal, Coll. Hodgs. p. 51; Kelaart, Prodromus, p. 96, et Cat. p. 116; Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 106; Horsf. & Moore. Cat. B. Mus. E. I. Co. i. p. 70 (1854); Holdsworth, P. Z. S. 1872, p. 418.

Scops aldrovandi, Blyth, Cat. B. Mus. A. S. B. p. 36 (1849).

Ephialtes pennatus, Jerd. B. of Ind. i. p. 136 (1862); Hume, Rough Notes, p. 386 (1870); Jerd. Ibis, 1871, p. 347.

Ephialtes bakkamœna, Blyth, Ibis, 1866, p. 255; Jerd. Ibis, 1871, p. 347.

Scops pennatus, Gould, B. of Asia, part 22 (pt.); Hume, Nests and Eggs, i. p. 65 (1873).

The Indian Scops Owl, apud Jerdon; *Choghad Rusial, Sunya Rusal*, Nepal; *Chitta guba, Yeria chitta guba*, Tel. (Jerdon).

Bassa, Punchi-Bassa, Sinhalese.

Adult female (Ceylon).—Length (estimated from skin) 6·8 inches; culmen from cere 0·5; wing 5·0; tail 2·4; tarsus 0·75; mid toe 0·7, its claw (straight) 0·34.

The above measurements are taken from an adult specimen shot in the Kandy district. The dimensions of a "*reddish Owl*," shot in Haputale last January, concerning which Mr. Bligh writes me, which may appertain to this species (though more probably referable to the rufous phase of the next), are as follows:—Length 6·2 inches; wing 4·8; tail 2·25; tarsus 0·9. Weight $2\frac{1}{4}$ oz.

Iris "bright yellow; bill 'horny,' darker at tip" (*Whyte*); feet fleshy green; cere olive-brown.

Head, entire upper surface, sides, and lower part of throat fine rufous-chestnut; forehead and part of crown and ear-tufts with broad black mesial stripes, diminishing to narrow lines on the occiput and hind neck; back and lower scapulars with irregular black shaft-lines and transverse pencillings of the same hue; least wing-coverts with the concealed bases of the feathers blackish, the median and greater series with narrow pointed central stripes; lateral scapulars with most of the outer webs white, and a black terminal patch confined to the outer web; a few of the outer feathers of the median and greater wing-coverts with white lateral patches; edge of carpal joint white; outer webs of primaries and secondaries crossed with wavy black marks, developing on the inner webs into broader but ill-defined bars, the basal portions of the webs much mottled with blackish; tail crossed with fine, skeleton, wavy bars of blackish, those on the inner webs of the 3 lateral feathers being darker and more complete than the rest.

Most of the loral plumes and some of the feathers at each side of the forehead white at the base; terminal portions of the loral shafts black; chin fulvous; ruff-feathers with deep black tips, forming a prominent border; the uppermost series white at the centre; chest-feathers with broad mesial stripes; ground-colour of the breast and flanks white, each feather with a black mesial stripe of varying width at the centre, breaking up into transverse pencillings on a rufous ground patch, these markings so arranged as to have an incomplete and clear white bar across the centre of the feather; underlying abdominal plumes, thighs, and under tail-coverts buffy white; knees and front of tarsus rufous, posterior part of tarsus whitish; a few longitudinal dark marks on the tail-coverts; under wing mingled buff and rufous, the outer feathers marked with black.

Young. An immature male shot in the cinnamon-gardens in May last, and which is just beginning to acquire its yearling plumage, measured as follows in the flesh:—Length 6·0 inches; wing 5·0; tail 2·25; tarsus 0·75.

Iris bright yellow.

Above a paler rufous than the adult, the feathers of the forehead and crown with narrow mesial lines of black as in the adult, and all the feathers of the body with indistinct white terminal margins, preceded by a blackish but inconspicuous and narrow bar. The shorter lateral scapulars have the outer webs white, but not so pure as in the adult; the longer series with central blackish markings; the winglet with white spots on the outer webs of

the feathers, but the primaries *without them*, the entire feather being rufous, with skeleton black bars on the outer webs, and broad bands of the same on the inner; tail crossed with blackish lines.

Throat and fore neck paler rufous than the back, barred obsoletely with brownish; breast and lower parts mostly white, the feathers with mesial black lines and cross rays branching off from them; under wing white, the exterior feathers dashed with rufous and marked with black.

The least wing-coverts in this specimen are those of the full yearling dress and are dark rufous, contrasting as a band against the paler hue of the rest of the wing. Jerdon remarks of the young of Indian examples that they are duller red than the adults, with the feathers more black-shafted, and that there is much white on the lower surface.

Obs. The adult example above described, and which has lately been sent home to the British Museum by Messrs. Whyte and Co., corresponds well with the series of *Scops sunia* in the national collection, its distinguishing features being the uniform rufous upper surface and the striated head, which are characteristic of the specimens from Malacca and India with which I have carefully compared it. This marked uniformity of coloration prevents the Ceylonese specimens, now to hand, of this species from being confounded with hepatic examples of the next (*Scops minutus*), notwithstanding that there is but a very slight disparity in size between the two.

One of Hodgson's specimens from Nepaul measures, wing 5·5, tarsus 0·85; another from Madras, wing 5·2, tarsus 0·85; a third from Pinang, wing 5·5, tarsus 0·9. There are slight differences in these from the Ceylon bird, which it may be as well to notice here, and which are as follows:—Nepaul: tail less barred, the central feathers almost wanting the bars, and those on the remainder fainter and more widely separated than in the Kandy specimen; the upper breast uniform with the chest, the white ground-colour commencing lower down. Madras: tail and breast similar to the Nepaul bird. Pinang: tail almost the same as in the Ceylon bird, the rufous colouring of the chest extending further down the breast. The upper surfaces and facial markings of all correspond with those of the Ceylonese example.

Distribution.—This little Owl was first recorded as a Ceylonese bird by Dr. Kelaart, who, however, gives no particulars of its habitat beyond remarking, at page 96 of his 'Prodromus,' "*Scops sunia*, a very small, reddish-yellow, Eared Owl, is occasionally seen in the very highest parts of the mountains." Since the publication of this note, the species does not seem to have been identified with certainty until now. Layard did not meet with the bird, simply remarking, in his 'Notes,' that it was procured at Nuwara Elliya by Kelaart. Mr. Holdsworth, writing 19 years after, has but little additional evidence to adduce; he quotes Kelaart, and says, "I have some recollection of seeing a specimen from the hills which I believe was the bird Kelaart referred to, and I think the species may be included in the Ceylon list." The example from which my description is taken was caught alive at Kattakelle, near Kandy, and is the only adult bird that I myself have seen from the island. An immature bird, described in this article, was killed close to Colombo in that well-known locality the cinnamon-gardens, proving that the species is widely distributed in Ceylon, inhabiting the low country on the seaboard as well as the mountainous districts. I am unable to state with certainty that the example spoken of by Mr. Bligh in a recent letter to me belongs to this species; but I have no doubt it will be found to inhabit the Haputale as well as the Nuwara-Elliya district, in which latter Kelaart seems to have made its acquaintance.

Jerdon remarks that it is found in India in forests and well-wooded districts, but is not very common. He procured it at Madras, and likewise obtained it in the Eastern and Western Ghauts, but not in Central India. In the sub-Himalayan districts it is by all accounts a fairly common bird. Mr. Thompson found it so in the Gurwhal forests, and Captain Hutton met with it frequently in Northern India. It extends into the Malayan peninsula as far south as Pinang, of which island it is an inhabitant.

Habits.—The Rufous Scops Owl is said to be an inhabitant of wooded districts and the edges of forests. In the Kandyan Province of Ceylon it has been met with on all occasions, I believe, on the outskirts of the jungle, either resorting to the vicinity of bungalows in search of food, or, like other Owls which have been so killed, hiding in detached trees, having wandered during the night far from its accustomed habitat. Mr. Whyte writes me that his specimen was caught by a coolie perched in a mango-tree, its plumage so saturated with rain that it was quite unable to fly. I do not find much concerning its habits in the writings of Indian naturalists. Jerdon remarks that the first specimen he ever procured was found dead outside his house at Madras, and had probably been killed by the crows; he says that it has a low mild hoot, which is

often heard soon after dark, and further that all he examined had fed on insects. Such is the food of most of our small Owls in Ceylon, the coleopterous class coming in for the greatest share of patronage; and doubtless the present species is as much an insect-feeder in the latter island as in India.

Nidification.—In India this Owl breeds, according to Mr. R. Thompson, from March until August, in holes of trees, usually at no great height from the ground. Unfortunately this gentleman never took the eggs, though he says the bird was common in the Gurwhal forests.

Captain Hutton states that it breeds in hollow trees, "laying three or four white eggs on the rotten wood," in March.

SCOPS MINUTUS.

(THE LITTLE SCOPS OWL.)

(Peculiar to Ceylon.)

Glaucidium malabaricum!, Whyte, Str. Feath. 1877, p. 201.
Scops minutus, Legge, Ann. & Mag. Nat. Hist. 1878, i. p. 175.
The Little Owl of Planters in Ceylon.
Punchi-Bassa, Sinhalese.

S. minimus: similis *S. malayano*, sed minor et saturatior, subtùs obscurior et brunneo magis vermiculatus: colore rufescente dorsi gulæ et præpectoris absente.

Adult. Length to front of cere (from skin) 6·0 inches; culmen from cere 0·55; wing 4·75 to 4·85; tail 2·1 to 2·3; tarsus 0·7 to 0·8; mid toe 0·75, claw (straight) 0·3; height of bill at cere 0·25. Weight $2\frac{1}{4}$ oz.

Iris yellow; cere greenish; bill olivaceous brown; feet fleshy brown; claws dusky.

Above dark brown, the feathers of the head, back, rump, scapulars, tertials, and wing-coverts crossed at the centre with transverse spots of ochraceous, spotted finely and closely vermiculated on the rest of their surfaces with greyish and ochraceous grey, surrounding transverse irregular markings of blackish; feathers of the hind neck crossed with bold wavy markings of whitish, and margined with rufescent buff; outer scapulars white externally, with terminal black spots and oblique central bars of the same, edged with rufous; the primary and outer secondary coverts have their dark markings mingled with rufous patches, and set off with white spots near the tips of the outer webs; primaries and secondaries brownish rufous, mottled with blackish brown, and the inner webs banded broadly with the same; the outer webs of the first five primaries crossed with five white, blackish-margined bars, the tips paler than the rest of the feather and mottled with dark brown; tail brownish, washed with rufous on some of the feathers near the base, mottled with blackish brown and crossed with five or six bars of buff-white with black edges.

Ear-tufts concolorous with the head, and rufous at the base of the feathers; loral plumes black, with white bases; facial disk grey, pencilled with blackish; ruff pale rufous, the feathers edged and centred with blackish brown; chin whitish; fore neck and under surface, together with the flanks, closely stippled with iron-grey on a white ground, the feathers with broadish central stripes of blackish, and crossed on their concealed portions with fine, wavy, transverse, black marks; on the lower parts the stippling is more open, the under tail-coverts being chiefly white, with the markings confined to the tips; legs rufescent, with wavy brown transverse marks; under wing-coverts whitish, shaded with rufescent, and crossed with irregular markings of brown.

The above is a description of the type specimen in the British Museum. A second, killed near Kandy, is slightly larger, having the wing 4·85 inches. It has the markings both above and beneath bolder and more open on the back, the transverse white spottings are larger, and the black markings take the form of shaft-lines; the ruff is rich buff and much more deeply tipped with black, and the under surface from the breast downwards is whiter and not so closely stippled, the markings taking the form of open vermiculations, with bold mesial stripes on most of the feathers.

Another example in the Colombo Museum, kindly loaned to me by the authorities of that institution, is in a rufous phase of plumage; whether this is the result of youth or not, I am unable with certainty to say, as it has no signs of nestling attire about it. Wing 4·82 inches. Iris yellow.

Upper surface, in the distribution of its markings, similar in most respects to the second example above treated of, but the mesial striæ not pronounced, the tips of the feathers mottled with blackish grey and fulvous, and the webs across the centre rufous; the lateral scapulars have the outer webs chiefly white, tipped with mingled black and rufous, the anterior quills with rufous-white marginal spots on the outer webs; the lower ear-tuft feathers and those of the ruff a decided rufous, the latter tipped with black, anterior to which is a fulvous-white patch on each feather; the breast and flanks rufescent white; the feathers of the sides of the breast and flanks with mesial black stripes and blackish mottlings at the tips; some of the striæ with a rufous edge, and some of the feathers rufous at their bases.

Young. A young bird in nestling plumage, which I had in confinement for a short time at Trincomalie, appears to

1 GLAUCIDIUM CASTANONOTUM
2 SCOPS MINUTUS

belong to the present species; and should time and a more extended acquaintance than I have been able to cultivate with this little Owl prove that I am right, it will be apparent that some examples assume a rufous phase, and perhaps retain it through life.

The dimensions of this specimen prove, I think, that it is too small to belong to the last species.

Wing 4·7 inches; tail 2·0; tarsus 0·75.

Iris yellow; bill greenish horn; cere olivaceous; feet brownish.

The general hue of the upper surface is rufescent fulvous (the back and median wing-coverts more rufous than the rest), mottled throughout with greyish, and faintly cross-rayed or pencilled with blackish; forehead and crown with not very perceptible shaft-lines of black; lateral scapulars white, with black terminal patches; inner webs of the greater wing-coverts mottled with blackish, the outer webs of the foremost series indented with white; outer webs of the first five primaries deeply indented with white, with a black edge to each indentation; inner webs mottled and crossed with dark shadings, vermiculated with the rufous ground-colour; ground-colour of the tail rufous-grey, mottled and cross-rayed with black; outer web of the lateral feathers indented with white.

Terminal portion of loral plumes white; face and edge of forehead greyish, cross-rayed with dusky, and beneath the eye with fulvous; ruff-feathers rufous, with fine dark tips; throat and chest mottled with yellowish buff and dark grey on a white ground; breast, flanks, and lower parts white, with cross-pencillings of dark sepia-brown and rufous, the dark markings on the flanks developing into indistinct shaft-lines. Under wing buff-white, clouded with dark brown and rufous near the edge; under tail-coverts whitish, pencilled with dusky; exterior side of tibia and tarsus marked with transverse lines of rufous.

Obs. This little Owl, in its ordinary brown plumage, approaches nearer to *Scops malayanus* than to any other Asiatic member of the genus; in size and in its rufous phase it comes close to *Scops sunia*. The closely stippled under plumage peculiar to the present species does not exist in the Malayan bird, which likewise has the ground-colour of the back to a considerable extent rufous, as also the sides of the breast-feathers. It is a much larger bird, the wings of a male and female in the Norwich Museum measuring 5·7 and 5·5 inches respectively. Rufous examples of *Scops minutus* will, I think, always be distinguished from ordinary specimens of *Scops sunia* by their smaller size, and by the less uniform character of the upper-surface plumage.

Distribution.—This small Owl, which is peculiar to the island, appears to be widely diffused throughout the hills of the Central Province, while it occurs rarely in various parts of the low country. Numerically speaking it is a rare bird, very few examples having as yet been procured. It is not possible to say whether Kelaart ever met with it or not; in continuation of the paragraph I have quoted in the last article, referring to *Scops sunia*, he speaks, at page 96 of his 'Prodromus,' of "the allied species, *Scops pennata*, being a low-country bird," which seems to imply that he was acquainted with a second small Scops Owl, none of which genus inhabit the island, with the exception of the present one.

To Mr. Bligh must be given the credit of obtaining the first authenticated example, which is the type of the species now in the national collection. It was caught in the chimney of his bungalow at Kotmalie, at an elevation of nearly 4000 feet. He writes me to say that he has met with four examples in all, the most of which I know are referable to the Haputale district. In May 1874 another specimen, referred to by Mr. Whyte under the name of *Glaucidium malabaricum* (the Malabar Wood-Owlet), was shot by Mr. J. R. Hughes on the Kitlamoola Estate; a further individual was killed by Mr. Macefield on the Deltota Estate, in April last year; and some time previous to this another in the rufous stage was shot near Colombo, and preserved in the new museum. The natives who brought me my young specimen at Trincomalie stated that it was a well-known bird to them; but I am, of course, unable to say that their remarks may not have referred to the last species. In the early part of 1876 I once or twice observed a very small Owl frequenting the trees in the Queen's House Gardens, which may probably have been this species. It will be seen, therefore, that though this species inhabits the low country, it is evidently more partial to the hill-districts, affecting the higher ranges as well as the upland valleys round Kandy.

Habits.—This species appears to be an inhabitant of the outskirts of woods, gardens, isolated jungles, thickets, &c., in the vicinity of forest. Mr. Bligh, who has had more experience of it than any one else, has generally observed it in the neighbourhood of his bungalow; the type specimen found its way into the chimney, and fell down into the fireplace stupified by the smoke. Another, to the best of his belief, took up its abode for many months near his house, testifying to its existence there by bringing into the verandah of the

bungalow its quarry, and devouring it in that peculiar locality—the remains of Bats, Finches (*Munia kelaarti*), "Bush-creepers" (*Zosterops ceylonensis*), and even those of a Robin Flycatcher (*Erythrosterna hyperythra*) affording ample testimony to the meals the little depredator had silently consumed in the dead of night! It was at last shot, and at the time had taken up its abode in a thicket of passion-flowers, out of which it sallied each evening, and resorted to a neighbouring grove of tall trees.

Since this article was written, I have heard again from my friend concerning one of these interesting little birds. He writes, "I have had the pleasure of seeing another of these little Owls several times of late by the bungalow; it is no doubt the mate of the one I lately shot: it generally alights on a thick branch, and unless you see it move, you would take it to be only a knot of wood, and it keeps, as a rule, perfectly still for some minutes at a time. It has a very feeble call, different in compass to any of the smaller Owls which I am acquainted with, though similar in character; it is like a short and feeble 'woot,' as it were jerked out. It is by no means a noisy or shy bird."

Besides small birds, the food of this Owl consists of moths and Coleoptera. In confinement it has much the same manner as Forster's Scops Owl. I kept my bird in a box, and when I approached it, it threw its head back, and staring up at me oscillated its body to and fro with a low growl of alarm.

It is scarcely necessary for me to remark that the cleverly-drawn lesser figure in the Plate accompanying this article represents this little Owl. It is from the type specimen in the British Museum.

Genus NINOX.

Head small, with the disk almost obsolete. Bill short, cere tumid. Nostrils oval, and near the anterior margin. Wings long and pointed, the 1st quill falling short of the 3rd, which is the longest, by more than the length of the tarsus. Tail moderately long. Tarsus stout, slightly longer than the anterior toe, scantily feathered to the base of the foot. Toes covered with hairy plumes to the tips, which are covered with one or two transverse scales.

NINOX SCUTULATA.

(THE BROWN HAWK-OWL.)

Strix scutulata, Raffl. Tr. Linn. Soc. xiii. p. 280 (1822).

Strix hirsuta, Temm. Pl. Col. i. pl. 289 (1824).

Athene malaccensis, Eyton, Ann. Nat. Hist. xvi. p. 228.

Athene scutulata, Gray, Gen. B. i. p. 35 (1844); Kelaart, Prodromus, Cat. p. 116 (1852); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 68 (1854).

Athene scutellata, Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 106.

Ninox scutulatus, Blyth, Cat. B. Mus. A. S. B. p. 38 (1849); Jerdon, B. of Ind. i. p. 147 (1862, in pt.); Hume, Rough Notes, p. 420 (1870); Armstrong, Str. Feath. 1876, p. 303.

Athene hirsuta, Bp. Consp. i. p. 41.

Ninox hirsutus, Bp. Rev. et Mag. de Zool. 1854, p. 543; Hume, Str. Feath. 1874, p. 151; id. 1875, p. 40.

Ninox hirsuta, Holdsworth, P. Z. S. 1872, p. 418; Ball, Str. Feath. 1874, pp. 333 & 383; Bligh, J. A. S. (Ceylon Br.), 1874, p. 66; Legge, Ibis, 1875, p. 279; id. Str. Feath. 1875, p. 368.

Ninox scutulata, Sharpe, Cat. B. ii. p. 156 (1875); Hume, Str. Feath. 1875, p. 285.

Ninox scutellata, Inglis & Hume, Str. Feath. 1876, p. 373.

The Brown Wood-Owl, Tickell, J. A. S. B.; *The Hairy Owl*, G. R. Gray.

Choghad besra, Hind.; *Kulpechak*, Beng., lit. "Death-Owl;" *Paini ganti vestam*, Tel.; *Tangki perchiok*, Lepch. (Jerdon); *Kheng-Boop*, Arracan; *Raja wali*, Malacca (Horsf.).

Bassa, *Punchi-Bassa*, Sinhalese; *Anda*, Tamils in Ceylon.

Adult male and female. Length to front of cere 9·8 to 10·3 inches; culmen from cere 0·55; wing 7·5 to 8·3; tail 4·5; tarsus 1·0 to 1·1; middle or outer anterior toe 1·1, its claw (straight) 0·53; height of bill at cere 0·27.

The above measurements are taken from eight Ceylonese examples. The average length of wing is about 7·8; one example in my collection measures 8·0, and another of a pair in the Poole collection 8·3, quite an abnormal dimension.

Iris golden yellow; cere dusky greenish; bill blackish blue on the sides of the upper mandible, the tip and the lower mandible paler; feet dusky yellow, the soles richer yellow than the upper surface of the toes; claws blackish, bluish at the base.

Above glossy chocolate-brown, the hue of the head, back, and sides of neck darker than the rest and pervaded with a cinereous tint; lower scapulars, greater wing-coverts, and rump slightly paler than the back; the outer scapulars marked with a largish concealed white patch, chiefly on the outer webs of the feathers; the tertials barred on

their concealed portions with white, the terminal bands generally showing; edge of the wing white; least wing-coverts darker brown than the rest; primaries, their coverts, and the secondaries rich deep brown, the margins of the longer primaries fulvous, and the inner webs of all the quills crossed with narrow bars, which, near the tip, are faintly lighter than the ground-colour, and near the base fulvescent buff; tail drab-brown, crossed with five deep brown bars and tipped pale, the basal bar being concealed beneath the coverts.

Edge of the forehead and base of the loral plumes white, shafts and tips of the loral and chin-plumes black; upper throat whitish, the feathers with dark shafts; sides of the face and ear-coverts concolorous with the head; chest, breast, and flanks rich chocolate-brown; the chest and upper breast-feathers margined laterally with fulvous-yellow; the centre of the breast, belly, flanks, and the lengthened tibial coverts crossed with a broad bar of white on the centre of each feather, and a patch of the same at the base; on the lower flanks some of the bars are usually interrupted at the centre; vent and under tail-coverts white, the latter sometimes barred or streaked slightly with dark brown; legs rufous-brown; the thighs spotted with buff; bases of the tarsal feathers whitish; bristles of the feet brown; lesser under wing-coverts chocolate-brown, spotted and margined with fulvous; primary under-coverts dark brown, scantily barred with buff.

Examples (even those which are adult) from Ceylon vary to a certain extent in the depth of the upper-surface colour, some being much darker on the back than others. The hue of the tail varies considerably, the oldest birds probably having the ground-colour less smoky or more cinereous than others. The yellow edgings of the chest-feathers extend down the sides of the breast in some examples, and the edges of the white bars on the under surface are conspicuously tinged with ochraceous yellow. The specimen mentioned below, from Maskeliya, and another I have seen from the Central Province are very dark above, and have the primary-coverts almost blackish brown; they are likewise very large birds.

*Young**. A nestling, taken from the nest by Mr. MacVicar, is described to me as very like the old bird in general aspect, clothed with fluffy brown feathers above, and having brown-centred white-margined feathers on the lower parts. At two months its plumage greatly resembled that of an adult. There are, however, slight differences which will be noticed in the following description of a yearling bird in my collection:—Upper surface lighter brown than the adult, with the lower head and hind neck contrasting more with the colour of the back; upper tail-coverts with pale tips; greater wing-coverts paling into rufous-brown at the edges, which are very finely margined pale; longer primaries with white indentations at the outer edges: secondaries edged near the tips with whitish; tail light drab, deeply tipped with greyish, and barred with five bands of a lighter brown than in the adult; beneath the coverts there is a sixth band.

Cheeks paler than the crown; chin white; chest and breast pale chocolate-brown, the former margined with whitish, and the latter barred very broadly with white; the feathers of the lower breast and belly tipped with white; lengthened tibial plumes, vent, and under tail-coverts unmarked white, the latter of which are in the *fluffy* stage.

Obs. The Ceylonese Hawk-Owl was considered by Temminck, who described it in 1824 from the island, as distinct from the *Strix scutulata* of Raffles, from Sumatra. The specific name of *hirsuta* has accordingly been applied by most writers to the Ceylon species, as the type of *N. scutulata* was not forthcoming for purposes of comparison and discrimination. Mr. Sharpe, in his catalogue of the Owls, has given an exhaustive series of comparative descriptions of the Hawk-Owl from the Indian Peninsula, Ceylon, Malacca, Labuan, various parts of China, Japan, and Formosa, and considers them to be identical. The race from Sumatra was not then represented in the collections he examined, and this important link was wanting to complete the chain of evidence as to the widely-spread species being the *S. scutulata* of Raffles. Lord Tweeddale has, however, since received an example from Sumatra which may fairly be considered to represent Raffles's bird. It is said to correspond well with Malaccan birds, as Mr. Sharpe suggested would one day be found to be the case; and the latter I find are not separable from our Ceylonese race. In size they compare well with our birds, the wings of four which I have examined varying from 7·7 to 7·9; another individual from Rangoon, and two from Labuan, the latter slightly smaller (7·4 in the wing), are likewise not to be separated as regards plumage from Ceylon birds. The hue of the upper surface, the dark cinereous tinge of the head, and the barring of the flanks and sides of the abdomen are the same in all. Whatever the birds from Northern India, Cachar, China, and Japan may be (and it is not my province, in a local work such as this, to go into the vexed question of this species), those from Southern India, Ceylon, Sumatra, the Nicobars,

* I find that I was in error, at page 280, 'Ibis,' 1875, in my description of the immature plumage; further investigation and experience have tended to show that the iris is variable in the adult, of which the bright fulvous edgings to the throat-feathers is also a frequent character.

Labuan, and Malacca represent the one species to which the oldest applied name of *scutulata* must be applied. With regard, however, to *Ninox lugubris*, which Mr. Sharpe separates from the present bird, I would remark that an immature specimen from Ceylon is quite as pale as any that I have seen of *lugubris*.

Distribution.—The Brown Hawk-Owl is widely distributed throughout the low country, and is also found in the mountain-zone at a considerable elevation. It is not uncommon in the wooded portions of the Western Province, extending from the Pasdun Korale northward through the Raygam and Three Korales to Kurunegala. It has been obtained as near Colombo as Kæsbawa and Kotté. In the forest and jungle-clad country south of the Bentota river it prefers the vicinity of rivers to the interior of the woods, and on the banks of the Gindurah it is quite common. In the Wellaway Korale and throughout the Eastern Province it is pretty generally dispersed, frequenting the borders of most of the tanks and the forests beneath the Hewa-Elliya Hills. Near the sea, between Batticaloa and Trincomalie, I found it at most halting-places along the coast-road, particularly at the Virgel and Topoor. It is to be found throughout the northern forest-tract, but not so plentifully as in the Trincomalie district, appearing in the Eastern Province to be always more common near the sea-coast than in the interior.

From the hills I have it from Maskeliya, whence Mr. E. Cobbold has kindly sent me a specimen, killed at about 4000 feet elevation; in Kotmalie Mr. Bligh procured it, that being the only hill-locality this gentleman has found it in. I have never heard its hoot in the Upper hills, and infer therefore that it does not inhabit so great an elevation; it would therefore, on the whole, be considered a rare species in the Central Province, and especially as regards Dumbara and the vicinity of Kandy, which is an excellent locality for some of its family. It appears to have successfully eluded the pursuit of our energetic ornithological pioneer, Layard, for he did not meet with a single specimen until he had been nearly eight years in the island.

Elsewhere the Brown Hawk-Owl is found in various wooded districts throughout India, extending into Burmah and Siam, and down the Malay Peninsula to the Straits, taking in the Nicobar Islands in its range to Sumatra. To the south-east it is found in Labuan and the west coast of Borneo, onwards to Celebes and the Moluccas. Turning to the north again we find it, as the *N. japonica*, inhabiting China, Formosa, and Japan. Touching its distribution in India, Mr. Bourdillon records it from the Travancore, where it confines itself to an elevation of above 2000 feet; Jerdon, who combines it with *N. lugubris*, says he has seen it in the Carnatic, Malabar coast, and Central India, and that it is rare in the Deccan and North-west Provinces. Concerning these latter, Mr. Hume says that it is almost unknown there, as also in the Punjaub and Rajpootana. In Chota Nagpur, Mr. Ball records it as not common. Capt. Feilden writes of the specimens he sent Mr. Hume from Thayetmyo, and which Mr. Hume identifies as *N. hirsutus*, that it is not common in that place. The note, he remarks, is like the mew of a small kitten; but our Ceylon bird has no such cry as this. In the Irrawaddy Delta, at Elephant Point, Dr. Armstrong found it abundant amongst clumps of trees and thin jungle near the coast. His specimens are, however, larger than the true *scutulata*, and perhaps are the same as the Cachar birds, which Mr. Hume separates as *N. innominata*.

Habits.—This Hawk-Owl has a marked preference for the vicinity of water; it is an insect-feeding species, and finds an abundance of such food near the borders of tanks and on the banks of rivers flowing through forest. It takes up its abode by day in thick jungle, particularly that description which is found growing to a height of about 30 feet at the upper borders of tanks, and which is densely matted at the top, forming a most suitable canopy from the rays of a tropical sun. Here the Brown Owl roosts, and, sleeping with "one eye open," does not admit of an easy approach; directly his haunts are invaded, out he shoots as sharply as any shy diurnal bird, and, taking sometimes a considerable flight, retreats into the most suitable cover he can find. In the hills it seems to frequent the interior of the forest, as Mr. Bligh informs us (*loc. cit.*) that he found three sitting together on a branch in "dense jungle," proving that it is more than usually sociable for a bird of its ilke. It hoots in the evening just after sundown, and is much more loquacious on moonlight nights than when it is dark. About 10 o'clock, after feeding, it recommences its not unmelodious hoot, resembling *whōō-wuk, whōō-wuk*, and which Layard not inaptly likens to the lowing note of the Bronze-winged Pigeon (*Calcophaps indica*). On a fine night it may be heard at a long distance in the almost unbroken stillness of the Ceylon forest, accompanied occasionally by the deep bay of the Sambur deer or the

complaining cry of the Loris (*Stenops gracilis*). In the morning it calls until a late hour, appearing to be regardless of the scorching rays of an eight o'clock sun, at which time I have seen it in an exposed situation on the banks of the Gindurah giving out its last matutinal cry. These Owls feed almost exclusively on beetles, moths, and grasshoppers, and seem to take their food until retiring in the morning, the stomach of a bird I killed in the Wellaway Korale at two o'clock in the afternoon being filled with undigested Coleoptera. They capture insects on the wing, and have the movements of Goatsuckers while hawking. Mr. Davison records of the allied Andaman species (*N. affinis*), that he observed it at Camorta, Nicobars, *hovering* in front of a cocoa-nut-palm, taking short circular flights from its perch, from which it would now and then dart suddenly up to a height of 15 or 20 feet. The singular cries attributed by Tickell and Dr. Hamilton to the North-Indian species are not applicable to our Ceylon bird. These writers liken them to the noise made by a strangling cat or a hare when caught by hounds. Besides the well-known hoot which I have referred to above, it is possible that this species is the author of a singular note which I have heard in the north-east and south-east of Ceylon, but which I never succeeded in identifying. It may be likened to the syllables *whok—chok-korok*, uttered in moderately slow and even time and repeated for a long interval.

Nidification.—This species breeds in the early part of the year. Layard records shooting a female in November with the ovaries distended with eggs; and a nest found at Kæsbawa in the first week of April by the taxidermist of the Colombo Museum, Mr. Hart, contained one egg. This was pure white, of course, round in shape, and measured 1·45 by 1·27 inch. Another nest, containing one nestling, was found by Mr. MacVicar in April 1873, near Bopé. It was situated in a hole in a mango-tree, about 15 feet from the ground; at the bottom of the cavity there were no materials, the chick reposing simply on the dead wood of the tree.

Genus GLAUCIDIUM.

Of small size. Bill short, rapidly curved from the cere. Cere tumid. Nostrils circular. Facial disk obsolete, the loral plumes very long. Wings short, rounded, falling short of the tail by more than the length of the tarsus; 1st quill short, as in *Ninox*, 4th and 5th quills subequal and longest. Tail moderate. Tarsus stout, longer than the anterior toes, well feathered. Toes covered with hairy plumes, claws rather long and acute.

GLAUCIDIUM CASTANONOTUM.

(THE CHESTNUT-BACKED OWLET.)

(Peculiar to Ceylon.)

Athene castanoptera, Blyth, J. A. S. xv. p. 280 (1846, nec Horsf.).

Athene castanotus, Blyth, Cat. B. Mus. A. S. B. p. 39 (1849); Kelaart, Prodromus, Cat. p. 116 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 105; Blyth, Ibis, 1866, p. 259.

Tænioglaux castanonotus, Bp. Rev. et Mag. de Zool. 1854, p. 544.

Noctua castanonota, Schl. Mus. P.-B. *Striges*, p. 34 (1862).

Athene castaneonotus, Blyth, Ibis, 1867, p. 295; Hume, Rough Notes, p. 412 (1870).

Athene castaneonota, Gray, Hand-l. B. i. p. 39 (1869); Holdsworth, P. Z. S. 1872, p. 418.

Athene castanonota, Legge, Ibis, 1874, p. 11.

Glaucidium castanonotum, Sharpe, Ibis, 1875, p. 259; id. Cat. Birds, ii. p. 215 (1875).

The Ceylon Chestnut-winged Owl, Kelaart, Prodromus; *Chestnut-winged Owl*, Europeans in Ceylon.

Punchi-Bassa, Sinhalese; *Sin-Anda*, lit. "Small Owl," Tamils in Ceylon.

Suprà castaneo-rufus, scapularibus extùs nigro et fulvo fasciatim notatis, interdum sed rariùs albo maculatis: tectricibus alarum extùs obscurè nigro transfasciatis, majoribus vix fulvo apicatim notatis: primariis fuscescenti-nigris, extùs rufescenti-fulvo indentatis, secundariis castaneis obscurè nigro transfasciatis: supracaudalibus et rectricibus nigricantibus, angustè fulvo apicatis et 9-fasciatis; pileo cum nuchâ et collo postico, colli et capitis lateribus nigricanti-brunneis, angustè rufescenti-fulvo transfasciatis, interscapulio quoque paullò nigricanti fasciato: torque collari albo indistincto, plumis quibusdam longitudinaliter et irregulariter albo notatis: plumis anteocularibus albidis, scapis elongatis nigris: plumis oculo circumdatis albidis: mento albo, utrinque ad genas anticas triangulariter extenso: maculâ jugulari magnâ albâ: plagâ latâ gulari nigricanti-brunneâ fulvescenti-albo transfasciatâ: pectore summo et laterali nigricante, castaneo lavato et rufescenti-fulvo transfasciato: pectore medio, abdomine et subcaudalibus purè albis, his medialiter nigro notatis: hypochondriis rufescenti-brunneo longitudinaliter maculatis: tibiis et plumis tarsalibus albis brunneo maculatis et fasciatis: margine alari albido: subalaribus et axillaribus albis flavo vix lavatis, illis conspicuè subterminaliter nigro notatis: rostro pallidè olivaceo, rictu et cerâ plumbeis: pedibus olivaceis: iride lætè flavâ.

Adult male and female. Length to front of cere 7·0 to 7·4 inches; culmen from cere 0·6 to 0·62; wing 4·9 to 5·55; tail 2·3 to 2·6; tarsus 0·9 to 1·1; middle or outer anterior toe 0·8, its claw (straight) 0·55; height of bill at cere 0·3. Expanse 18·7 inches; weight 4 oz.

The above measurements are taken from a series of seven examples, in which the males exceed as a whole the females, although one of the former has the wing 4·9 inches.

Iris primrose-yellow, in some slightly mottled with brown at the outer edge; eyelid dark olive-brown; cere and gape dusky greenish; bill greenish horn-colour; feet olivaceous, in some "woody" green, soles yellowish; claws brown, pale at base. Layard erroneously describes the iris of this species as reddish brown.

Head, sides, and back of neck, down to the interscapular region, cheeks, throat, chest, and sides of breast dark brown, everywhere narrowly barred with whitish, more or less tinged with buff, particularly on the head and back of neck, where the markings, in some, are rufous-white; back, scapulars, upper tertials, and all the wing-coverts reddish chestnut, with indications, more or less distinct, of dark bars across the feathers; primaries, with their coverts, and secondaries brown, pervaded with a chestnut hue, and barred with the hue of the back, which, towards the base of the inner webs, turns into fulvous-buff and spreads over the feather: the outer terminal bars of the primaries pale fulvous; edge of the wing pure white; upper tail-coverts and tail brownish black, the former barred with buff-white or pale rufescent, and the latter tipped and crossed with seven narrow non-corresponding bars of white.

Loral plumes black, the lower ones barred with whitish; a patch beneath the cheeks, a large space in the centre of the fore neck, centre of the breast, and all the lower parts white, the feathers on the sides of the breast, belly, and thigh-plumes with broad shaft-streaks of rufous-brown, or in some blackish brown; under tail-coverts in some unmarked white, in others marked with a few dark streaks; legs whitish posteriorly, the thighs barred with blackish brown; bases of the tarsal feathers blackish, showing on the surface; plumes of the feet greyish; secondary under wing-coverts white, the feathers beneath the point of the wing spotted with dark brown and ochraceous; base of the primaries yellowish white.

Obs. Scarcely any two specimens of this Owl are marked alike, the amount of indistinct dark barring on the chestnut mantle differing in almost every example. Some birds have the feathers at the lowermost portion of the hind neck boldly barred with white, others have them marked with spear-shaped centres of white; and in some, again, the rufous hue of the back obscures the light bars for some distance up the hind neck. The most singular variation, however, exists in the casual occurrence of white feathers in the scapulars. I have observed this on two examples, one of which forms the subject of the figure in the Plate. In this the outer webs of the lateral scapulars are white, surrounded by a blackish-brown edging. In this characteristic the species shows an inclination towards *G. castanopterum*, the Javan Owlet, which has the outer feathers of the greater wing-coverts, as well as the lateral scapulars with the outer webs, white; the lower breast and flanks are likewise boldly dashed with broad longitudinal streaks of rufous-brown in this latter species. It is also a larger bird, measuring from 5·7 to 6·1 in the wing. It is worthy of remark that the example delineated in the Plate has the stripes of the lower parts exceedingly rufous, approaching in this respect also to the Javan bird.

Distribution.—This pretty little Owlet, one of our peculiar Ceylonese forms, was considered by Kelaart to be confined to the hill-zone. It was discovered by Dr. Templeton, and described by Mr. Blyth of Calcutta, from specimens forwarded to him by the Doctor in 1846. It is found chiefly in the mountains of the island and the low country of the western and southern portions. It is tolerably common in Saffragam and in the Hewagam, Pasdun, and Raygam Korales, and is not unfrequent near Colombo. I have obtained it at Galkisse, and Layard speaks of it as being very common near Colombo in 1852, but remarks that for nine years previously no specimens had been procured in the neighbourhood. This was, perhaps, from want of search, for it breeds not far distant from there. It occurs in the Kurunegala district and also in the south-western wooded hills. It is found in the jungles at the base of the Haputale hills and on the north side of the hill-zone at the foot of the Matale ranges, but how far north it extends I am unable to say. I have never met with it in the northern forest-tracts, nor on the coast from Batticaloa northwards; it has been procured on the west coast as high up as *Madampe*, beyond which I am not aware that it has been traced. In the Kandyan Province it is a common bird and widely distributed, being well known in all the coffee-districts, among which may be mentioned, more particularly, Dumbara, Kalebokka, Haputale, and Maskeliya. It is not uncommon in the main range, in which I have met with it as high as Kandapolla, 6300 feet, and Dr. Kelaart has it in his list of birds from Nuwara Elliya.

Habits.—The Chestnut-winged Owl inhabits by choice forest and thickly-wooded country, but it by no means confines itself to jungle, for in the Western and Southern Provinces it is fond of the areca-palm and jack-tree groves, among which the Sinhalese build their habitations, close to the doors of which I have sometimes heard it, and on one occasion killed it. It perches in the top branches of tall trees and is very shy. It is crepuscular as well as nocturnal in its habits, issuing from the umbrageous retreat in which it has passed the day as early as four o'clock, and flying from tree to tree in its vicinity, calling continuously until sundown. Its note, which is a repeated guttural cry resembling the syllable *kraw*, is again heard in the morning shortly after daybreak, and is sometimes continued on gloomy days until 8 or 9 o'clock. I have never heard the

Cuckoo-like call spoken of by Layard as belonging to this Owl, and am inclined to think that he, like myself, mistook the note of the Hawk-Owl (*Ninox scutulata*), which answers to his description, for that of this species. Its usual food consists of Coleoptera and lizards, the former of which it takes on the wing. My friend Mr. Forbes Laurie has seen these Owls in the Kalebokka district hawking at sundown about wooded streams, and capturing beetles. Higher game than either of these, however, is sometimes aspired to; for Mr. Cobbold, of Maskeliya, informs me that he has witnessed one of these birds attacking a squirrel, and others have known them to kill small birds, such as Finches (*Munia*) and the Hill White-eye (*Zosterops ceylonensis*). This little Owl sees well in broad daylight, and has a very acute sense of hearing.

Nidification.—This species breeds, in the west of Ceylon, during March, April, and May. It lays in a hole in the trunk or limb of a tree, the cocoanut-palm being sometimes chosen; the eggs are deposited on the bare wood, and are two in number. A pair which I examined, and which were taken from the nest by the taxidermist of the Colombo Museum, were oval in shape, pure white in colour, and measured respectively 1·41 by 1·15 inch, and 1·34 by 1·08 inch, showing a considerable disparity in size.

The right-hand figure in the Plate accompanying my article on *Scops minutus* represents the example above referred to, with more white on the scapulars than I have seen in any other. Mr. Keulemans's talented pencil has portrayed this Owl in an attitude very characteristic of the genus *Glaucidium*.

GLAUCIDIUM RADIATUM.

(THE JUNGLE OWLET.)

Strix radiata, Tickell, J. A. S. B. ii. p. 572.

Noctua perlineata, Hodgson, J. A. S. B. xi. p. 269.

Athene erythroptera, Gould, P. Z. S. 1837, p. 136.

Athene undulata, Blyth, J. A. S. B. xi. p. 457.

Athene radiata, Blyth, J. A. S. B. xv. p. 281; id. Cat. B. Mus. A. S. B. p. 39 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 67 (1854); Jerd. B. of Ind. i. p. 143 (1862); Hume, Rough Notes, ii. p. 409; id. Nests and Eggs, i. p. 70 (1873); Ball, Str. Feath. 1874. p. 383; Hume & Butler, ibid. 1875, p. 450.

Tænioglaux radiata, Bp. Rev. et Mag. de Zool. 1854, p. 544.

Noctua radiata, Schl. Mus. P.-B. *Striges*, p. 34.

Glaucidium radiatum, Sharpe, Ibis, 1875, p. 259; id. Cat. Birds, ii. p. 217 (1875).

Glaucidium malabaricum, Legge, Str. Feath. 1876, p. 242 (first record of species from Ceylon).

The Barred Owlet of some; *Jungli Choghad*, Hind.; *Chagad*, Nepaul; *Chota Ralpencha*, Beng.; *Adavi paine gunte*, Tel. (Jerdon).

Adult female. Length to front of cere 7·9 inches; culmen from cere 0·7; wing 5·1; tail 2·6; tarsus 1·0; mid toe 0·8, its claw (straight) 0·5; height of bill at cere 0·3.

The above measurements are taken from the only specimen procured in Ceylon. A series of North-Indian *G. radiatum* gives as follows—wing 4·8 to 5·4 inches; tail 2·5 to 2·7.

Iris pale greenish yellow; bill and cere dusky greenish, tip of the mandible yellowish; feet greenish yellow.

Entire head above, sides and back of neck, back, scapulars, wing-coverts, upper tail-coverts, and tertials a dark and somewhat ashen brown, closely and narrowly barred with rufescent white on the upper parts, and with white on the longer scapulars, tertials, and tail-coverts; the lateral scapulars with broad bars of white on the outer webs; lesser wing-coverts obscurely barred with rufescent; winglet, outer median and greater coverts dark brown, barred narrowly with rufous, the outermost median feathers with a broad white patch on their outer webs; primaries and secondaries rich hair-brown, crossed with bands of rufous, paling into whitish at the edge of the longer primaries and near the tips of the secondaries; tail darker brown than the primaries, tipped and crossed with seven narrow bars of white.

Lores blackish, the basal portions of the webs whitish; face and ear-coverts concolorous with the head, but more openly barred; chin whitish, the plumes tipped with black; beneath the cheeks a broad band of white running beneath the ear-coverts, and an extensive patch of the same on the lower part of the fore neck; across the throat a band of brown, narrowly barred with pale rufescent, blending into the markings of the hind neck; chest, sides of breast, flanks, and thigh-coverts a blacker brown than the upper surface, barred on the chest with fulvous-white, and on the lower parts with broader bands of white; down the centre of the breast, the abdomen, under tail-coverts, and legs white; outer side of thighs and upper portion of tarsus barred with brown; under tail-coverts marked with bar-like spots of the same; under wing-coverts fulvous-white, paling into white at the edge of the wing, and marked down the centre with a longitudinal band of rufous, the feathers composing it spotted with brown; under surface of base of primaries rufescent.

Obs. The example from which the above description is taken corresponds with a number of North-Bengal, Darjiling, and Nepaul examples in the collection of the British Museum, and is another of the singular instances, exemplified in *Spizaetus kelaarti* (the Ceylonese race of *S. nipalensis*), *Bubo nipalensis*, and others, in which a North-Indian bird is found to extend its range to Ceylon over the heads, so to speak, of the South-Indian and neighbouring species. Not being well acquainted while in Ceylon with either *G. radiatum* or *G. malabaricum*, I naturally assigned

my bird ('Stray Feathers,' *loc. cit.*) to the latter, as it came tolerably close to it in description. It has, however, I find, no pretensions to a relationship with the southern form, which, besides its more rufous colouring, has a smaller wing—three specimens having, respectively, wings measuring 4·8, 4·9, 4·8 inches, and, as a rule, more white about the fore neck. The Ceylonese bird, however, in the less rufescent tint of the upper-surface bars, and in the somewhat blacker hue of the dark flank-bands, has some slight difference to Bengal birds, but no more than is generally the case with insular examples of northern forms. The amount of white on the outer secondary wing-coverts and the type of barring on the tail are identical in both; in fact a specimen in my collection procured by Mr. A. Anderson in North India is, with the exception of the slightly rufescent bars of the upper surface, the counterpart of the bird described in this article.

Distribution.—This curious Owlet is in reality not an uncommon bird, but it appears not to have been procured in the island by any one but myself. Guided solely by the clue to its range afforded me in its remarkable note, I think I shall not be in error when I say that it is widely distributed, but not so much so as the Chestnut-winged Owlet, being, for the most part, confined to the southern half of the island, extending up the eastern side, perhaps, to the termination of the heavily-wooded country to the south of the Virgel, and occurring in the Uva district of the Central Province. There is, however, no reason to infer that it may not exist in the northern forests, but I have never heard it in them. I first met with it in 1873, while encamped in the recesses of the extensive timber-forests in the hills on the south bank of the Gindurah. In the same year my acquaintance with its extraordinary call was renewed in several parts of the low country between Haputale and Hambantota, but no example was procured. In 1875 I came upon it again in various localities between Batticaloa and the base of the Hewa-Elliya range, and also heard its hoot in the jungles on Namooni-kuli mountain, near Badulla. From the number of birds I heard in the east of Ceylon, I infer that its head-quarters are in that part of the island; and, as a hill-bird, it may (in common with other species, which range from the eastern side into Uva only, without going west of Nuwara Elliya) be confined to the eastern portion of the mountain-zone, or, on the contrary, be found throughout the whole of it; for I have no doubt that it will some day be met with in the Peak jungles, which are similar in character and climate to those of the south-western district.

The habitat of this Owl on the mainland, according to Mr. Hume, is "chiefly the sub-Himalayan country and the lower ranges of the hills themselves as far west as Mandi." It is, however, found in widely-scattered districts throughout India. Though it does not appear to be found in Lower Bengal nor in the plains of the North-west and Central Provinces, yet Mr. Ball records it as not uncommon in Chota Nagpur. It has been procured in parts of the Madras Presidency and at Anjango on the Travancore coast. Captain Butler records it as an inhabitant of the woods at the foot of Mount Aboo, though it does not occur anywhere else in the Guzerat district, nor in the Kandhala region worked by Mr. Fairbank. Dr. Cantor has procured it at a place called Keddah in Malacca.

Habits.—The Jungle-Owlet frequents lofty timber-forests (the "Mukalana" of the Sinhalese), the dense jungle generally growing in the Eastern Province, luxuriant woods in the Park country, and even low scrubby jungle near the sea-coast. In the latter situation I met with it at Tevalāmune, on the Batticaloa lake. Its habits are more diurnal than any other Owl I am acquainted with, and its curious call attracts notice where-ever it is to be found. This is, for the most part, uttered by day during dull mornings and afternoons, or at any time when the bird is disturbed in the forest by a sudden sound, such as the report of a gun or the bark of a dog; at such times its loud spasmodic call impresses the hearer with the suspicion of anger in the little "bird of ill-omen" at being disturbed in its sylvan retreats! The effect of diurnal gloom on its disposition seems very marked, as it hoots at the fancied approach of night as soon as the sun is overcast with the quickly-passing showers so common in the Ceylon jungles. The only example procured by me, after many attempts to satisfy myself as to the authorship of such strange notes, was shot in the banks of the Maha-oya, on the new Batticaloa Road, about 10 o'clock on a damp August morning, when drenching showers were following each other at intervals of five or ten minutes, causing the little fellow to shout with unusual frequency, and enabling me to track him through the dripping underwood. He was continually on the move, and when overtaken was seated on a high *Euphorbia* tree beneath a dense cluster of its massive leaves. The note commences with the syllable *kāōw* slowly repeated and gradually accelerated until changed to *kāōw-whap, kāōw-whap,* which

increases in loudness until it is suddenly stopped. Tickell remarked of it in India that it kept up its clamorous cries during the greater part of the day. Thompson likens the note to the syllables *too-roo-roo-roo*, which does not accord with my experience of the singular Ceylon cry. Its flight is quick and straight, performed with vigorous flappings of the wings, and is very un-owl-like in character.

Mr. Thompson, as quoted by Mr. Hume in his 'Rough Notes,' remarks, "Its flight is both rapid and strong, with closed wings like that of the Besrah. It kills and devours all kinds of small birds, even taking them in the daytime. I had one caught which came down at a chicken three times all by itself, and killed it in the broad daylight." Notwithstanding these rapacious propensities, insects doubtless form its chief food, as will be seen from the extract subjoined below; the stomach of my specimen was crammed with beetles, a favourite food with small Raptors in Ceylon.

In Mr. Hume's notice of this species in 'Rough Notes' is contained the following interesting account of its habits. He says (p. 410), "These birds in confinement tame readily and eat raw or cooked meat. I have seen them in the daytime, in the shady verandah in which they were kept, kill and eat crickets, ants, and butterflies. A pair of sparrows made a nest on the interior cornice of the enclosed end of the verandah in which they lived. At first the sparrows teased and bothered the owls the whole day long at intervals, the owls merely retreating inside their box, chattering angrily; but one night two of the three got loose, killed both sparrows, eating their breasts and entrails, and all the young ones, of which not a trace was left*. They did not attempt to leave the place (this was at Dehra), and I let the third loose, after which they gradually grew wilder (returning, however, for some weeks for the day to their box), and at last left the house altogether, although, when I gave it up, they were still hanging about the trees in the very jungly compound. They were excessively noisy birds, both by night and even at intervals by day, in fact, at times, a perfect nuisance. Dogs were their abomination; and the way in which, menaced by a puppy of mine, who evidently thought it famous fun, they would lower their heads, set out their wings and ear-coverts, and 'curse and swear' (a mixture of hissing and chattering utterly indescribable in words) was really quite 'edifying'"!

Jerdon says that it flies actively about during the day when disturbed, and testifies to having found it rarely in small flocks—probably a young brood with their parents.

Nidification.—In India this Owlet breeds from April until May, which is doubtless the season for its nesting in the south of Ceylon. It nests, according to Mr. Thompson, in holes in small trees. The eggs have not been procured; but the young ones, which have several times been taken, are from three to four in number.

* These were evidently bolted whole.—W. V. L.

ACCIPITRES.

STRIGES.

BUBONIDÆ.

SYRNIINÆ.

Genus SYRNIUM.

Of moderate size. Bill stout, cere advanced; a well-developed facial disk incomplete above the eyes. Head without ear-tufts. Wings moderate, rounded; the 4th quill the longest, the 1st falling short of the 4th by the length of the tarsus and middle toe. Tail moderately long. Tarsus stout and thickly feathered. Toes in some thickly feathered, in others furnished with hair-like bristles, and sometimes bare; outer anterior toe longer than the inner; claws long and powerful.

SYRNIUM INDRANI.

(THE BROWN WOOD-OWL.)

Syrnium indrani, Blyth, Cat. B. Mus. A. S. B. p. 40 (1849, in part); Kelaart, Prodromus, Cat. p. 116 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 107.

Syrnium indranee, Jerd. B. of Ind. i. p. 121 (1862, in part); Holdsworth, P. Z. S. 1872, p. 415; Hume, Str. Feath. 1873, p. 429; Legge, ibid. 1874, p. 342; Rainey, ibid. 1875, p. 332; Sharpe, Cat. B. ii. p. 282 (1875).

Bulacca indranee, Hume, Rough Notes, ii. p. 347 (1870).

Syrnium ochrogenys, Hume, Str. Feath. 1873, p. 431.

Brown Owl, *Devil-bird*, Europeans in Ceylon; *Oulama Owl*, Kelaart.

Ulama, Sinhalese.

Ad. brunneus, capite et dorso concoloribus: collo postico obscurè albido vel pallidiore brunneo fasciato: scapularibus eodem modo fasciatis, extùs latè albo transversim notatis: tectricibus alarum brunneis ochrascenti-brunneo vel albido transfasciatis, majoribus extùs latiùs albo fasciatis: supracaudalibus brunneis albido angustiùs transfasciatis: rectricibus brunneis albo 12-fasciatis: areâ faciali cervinâ vel ochrascenti-fulvâ inconspicuè brunneo fasciatim notatâ: plagâ superciliari albidâ, scapis plumarum latè nigris: plumis oculis circumdatis et plagâ anteoculari nigris: limbo faciali brunneo: corpore reliquo subtùs fulvescente vel albido et brunneo regulariter transfasciato: pectoris lateribus et plumis tibialibus et tarsalibus obscuriùs fasciatis: subalaribus pectori concoloribus: remigibus subtùs brunneis ochrascenti-fulvo intùs fasciatis, versùs basin latiùs notatis: rostro cæruleo-albicante: iride castaneâ: pedibus corneis.

Adult male and female. Length to front of cere 17·0 to 18·0 inches; culmen from cere 1·0 to 1·1; wing 11·75 to 13·5 (average of seven examples 12·75), expanse (wing 13·25) 43·5; tail 6·5 to 7·5; tarsus 2·0 to 2·3; outer anterior toe 1·4 to 1·6, its claw (straight) 0·9; height of bill at cere 0·55. These dimensions are from a series of six Ceylonese examples.

Iris chocolate-brown, or a slightly reddish brown in some; pupil, in light, bluish; cere dusky bluish or olive: bill bluish near the cere, culmen darker than the sides, tip whitish horn-colour; toes dusky bluish; claws bluish horn, darker at the tips.

Head and upper surface glossy sepia-brown, palest on the secondary wing-coverts, longer scapulars, and rump, where the feathers are narrowly crossed with wavy bars of buffy white; lower tertials fulvous-brown, and barred similarly

to the adjacent coverts; least wing-coverts uniform, like the back; winglet and primary-coverts deep brown, barred with dusky fulvous; primaries paler brown than their coverts, secondaries somewhat lighter still, the whole deeply tipped with white and barred on both webs with dusky fulvous, paling into whitish at the inner edges, and into buff at the basal portions of the longer primary outer webs; first primary darker than the rest, and unbarred on the outer web; tail deep brown on the terminal portion, paling towards the base, tipped with white and barred with narrow non-corresponding bands of buffy white.

Disk rufous tawny, changing into whitish above the eyes, in some examples faintly barred with dark wavy lines; a circle of black feathers immediately round the eye, extending more or less to the loral plumes, which in some specimens are almost black, in others the basal part of the webs is whitish; upper part of ruff blackish brown, paling to dark brown beneath, and bounded externally by a zone of fulvous; beneath this the feathers of the throat are brownish, this colour usually taking the form of a zone across the fore neck; chest and under surface fulvous, closely barred with brown; under tail-coverts whitish, barred with darker brown than the breast; thighs, tarsi, and toes more ochraceous than the under surface, crossed with narrow, wavy, brownish bars; under wing-coverts concolorous with the breast, barred more closely and paling to buff-white at the edge of the wing; primary under wing-coverts blackish brown, paling to buff at the base; basal portions of the inner primaries and the secondaries beneath fulvescent white.

Examples from the upper hills (whether as a rule or not I cannot say) are darker on the disk, ruff, and lores than the low-country birds, and exhibit at the same time the facial barring which Mr. Hume found to be absent in his examination of the specimen on which he founded his Ceylonese race or subspecies *S. ochrogenys*. These birds have the barring of the under surface darker than the ochraceous-faced, paler-eyebrowed ones from the low country; but the ground-colour varies, being occasionally paler than in the latter.

Young. The nestling has the iris paler brown than the adult; cere and bill bluish leaden.

It is clothed with whitish down on the body, which gives place to the first or nestling feathers, which are edged with greyish buff, the scapulars, quills, and tail assuming from the first the brown hue noticed in the following description:—

Plumage on leaving the nest. Head, hind neck, scapulars, wing-coverts, lower back, and upper tail-coverts pale rufescent brown, the body-feathers broadly edged with whitish margins of a fluffy character; the scapulars and wing-coverts boldly barred with buff-white, and the greater coverts deeply tipped with the same; primaries and their coverts dark sepia-brown; the secondaries paler brown, the whole barred with pale ochraceous brown, and deeply tipped with whitish, the bars at the internal bases of the quills buff; tertials paler or more ochraceous brown than the secondaries, and narrowly barred with buffy white; back brownish; tail concolorous with the primaries, barred with narrow whitish marks, and tipped with white.

Lores and plumes between the eye and the forehead black; face ochre-yellow, darkening into rufous behind the eye; ruff and chin deep brown, the former edged with whitish; entire under surface buff-white, the feathers crossed with softened and indistinct rays of light ochraceous; under wing-coverts pale fulvous.

The above is a combined description from the example in my aviary (which was the subject of my article in 'Stray Feathers') and a second, shot in the Central Province; at this young stage even the face in the latter hill-bird is not so golden as was that of my tame, low-country one. The latter exhibited the following change of plumage during the first year:—After the lapse of a few weeks (about the 15th of June) the tips of the interscapular feathers next the scapulars and those of the lower part of the sides of the neck just above the point of the closed wing began to darken, and a V-shaped mark, having its apex about the middle of the back, was formed; this was the origin of the deep sepia-brown back of the adult. About a fortnight later the mature feathers (buff, barred with brown) began to appear on the tarsus, the fluffy plumage falling out to give place to them. In a short time the ground-colour of the tail-feathers deepened into blackish brown, and the adult feathers began to assert themselves elsewhere on the throat and parts of the breast. The tarsus and tibia took about three weeks to change, and by that time the whole of the interscapular region had become very deep sepia-brown; the downy feathers along the ulna commenced to fall out, and the deep brown edge to develop itself, while the wing-coverts kept pace with the rest, the whole wing rapidly becoming dark. In the mean time, while this moult was going on, the scapulars, quills, and tail-feathers darkened, assuming by a change in the feathers the hue of the adult. By the 31st of July the whole of the under surface was fully clothed with new feathers, the lesser wing-coverts were fully grown, the back had assumed the adult appearance, and the chin had become deep brown, the ruff extending beneath it by degrees. The facial disk had not altered at that time, but as the bird grew older it darkened into the normal yellow-rufous colour. The feathers of the head were the last to change, that part becoming dark brown about the middle of September; but it was not until the 30th November, when the bird was about 8 months old, that the last immature feather disappeared from above the right eye.

Obs. The Brown Wood-Owl, which has generally been associated with the species described by Col. Sykes from Southern India as *Syrnium indranee*, has of late been separated by Mr. Hume as *S. ochrogenys*, the grounds for so doing being that it was considered by him to have a more ochraceous disk than the Indian bird, and likewise to have that part not cross-rayed with dark lines. Sykes's type is not forthcoming now, nor are there any Southern-Indian birds in English collections, as far as I have been able to discern, from which it can be gathered what the species really is like. It is, of course, distinct from the Nepal bird (*S. newarense*), notwithstanding that some of the latter species are quite as small as Sykes's specimen was. His description, which applies well to Ceylonese examples, is in part as follows:—"Abdomine subrufo, brunneo graciliter fasciato; regione circumoculari nigrâ; disco rufo, brunneo marginato." With regard to the second point, concerning which it may be remarked that there is no evidence to show that it did not exist in the Indian bird, it will be seen that hill Ceylonese examples have the face more or less cross-marked with brown rays, though low-country birds have not as a rule. On the whole, therefore, in the absence of specimens from the districts where Sykes and Jerdon got them, it will be well to retain the Ceylon bird under its old title, until evidence is forthcoming to separate the Indian species, particularly as Mr. Hume lately writes me that he now considers the Nilgherry and Ceylonese species to be one and the same. In order to further the existing information concerning this interesting bird, and more especially for the benefit of my Ceylon readers, who are more or less interested in the so-called Devil-bird, it seems expedient to give a figure of the species, which I have accordingly done*.

Distribution.—The Brown Wood-Owl is distributed over the whole of Ceylon, inhabiting the low-country jungles of both the north and the south of the island, as well as the forests of the hill-zone up to the altitude of the Nuwara-Elliya plateau. In the Kandyan Province it is pretty generally found throughout all the coffee-districts, and is not at all uncommon in the neighbourhood of Kandy. In the upper ranges I have met with it at Kandapolla, and in the British Museum there are specimens from Nuwara Elliya. In the western parts of the low country it is a bird of local distribution, but in the wild jungles of the north and east I imagine it is everywhere to be found. I have myself met with it close to Trincomalie, and others have procured it in various parts of the Vanni. In the Colombo district it has been shot as near to Colombo as Kæsbawa, and in the scattered jungles, commencing about 20 miles inland and extending more or less to the base of the hills, it is not unfrequent. More favourable to its nature are, however, the continued woods and forests clothing the country, further south, between the Kaluganga and Dondra Head, and there it is tolerably common. Between Kalatura and Agalawatta, in a comparatively maritime part of the country, I have heard several of these Owls on a single evening hooting within a short distance of each other.

Jerdon remarks that this species is found throughout Southern India, in Ceylon, and the Malayan Peninsula. He makes mention of it as follows:—"It frequents the forest only, and is most common at a considerable elevation. Col. Sykes found it in the dense woods of the Ghâts. I procured it first on the Nilghiris, and afterwards along the Western Ghâts in the Wynaad and Coorg. It has also been sent from Goonsoor." It does not appear to have been found north of the Deccan, and does not inhabit either Burmah or Tenasserim; with regard to the Malayan Peninsula it has been procured in that region by Dr. Maingay, Lord Tweeddale being in possession of a skin sent home by that gentleman. On the authority of the late Mr. Swinhoe it has also been assigned to the island of Formosa; the specimen was described in 'The Ibis,' 1863, p. 218, under the name of *Bubo caligatus*, and was supposed by Mr. Gurney to belong perhaps to this species; but it was afterwards found to be *Syrnium newarense*, and is described as such in Swinhoe's "Catalogue of the Birds of China," P. Z. S. 1871, p. 344.

Habits.—This fine Owl, which has received the ill-omened name of Devil-bird, on account of the dire noises which the natives of the island have always ascribed to it, frequents shady forest-groves, woods of moderate extent, and portions of heavy jungle, near clearings and open places. I have met with it half a dozen times without being able to procure it, so sharp-sighted is it by day; it was, on several occasions, being most thoroughly mobbed by the Jungle-Drongos (*Buchanga longicaudata*) in company with a host of Bulbuls, who were pursuing it from tree to tree with a chattering incessant enough to bewilder a wiser bird than even an Owl! On another occasion I witnessed its persecution, in a forest near Ambepussa, by two or three pairs of

* My Plate was drawn some months prior to working out my article, and the bird was styled by Mr. Hume's name *ochrogenys*, which I have now had altered.

Racket-tailed Drongos (*Dissemurus lophorhinus*); so that the "Devil-bird," notwithstanding its redoubtable sobriquet, does not appear to be much respected, by the King-Crows at any rate!

There is no bird in Ceylon to which so much interest attaches, both among the European and indigenous population, as the present. If the subject of ornithology be mooted in conversation, questions are invariably asked as to the "Devil-bird," What is it? have its direful notes been heard? and so forth. Very diverse opinions have always existed as to the identity of the bird, notwithstanding that the natives of the island, and consequently those who have worked at its ornithology and gathered much of their knowledge of the habits of its birds from them, have always attributed the discordant notes uttered by some nocturnal bird to the present species. Kelaart writes, "The shriek of the Devil-bird (*S. indrani*) is truly appalling. The superstitious natives listen to these dismal cries with great horror; some death or less misfortune is apprehended when an Owl sings (?) nightly over a hut or on a tree overshadowing it." Layard follows with the information that the Wood-Owl "utters the most doleful cries, which the natives consider the sure signs of approaching evil." Sir E. Tennent writes that the Sinhalese regard this Owl "literally with horror, and its scream by night in the vicinity of a village is bewailed as the harbinger of impending calamity;" and further that there is a "popular legend in connection with it, to the effect that a morose and savage husband, who suspected the fidelity of his wife, availed himself of her absence to kill her child, of whose paternity he was doubtful, and on her return placed before her a curry prepared from its flesh. Of this the unhappy woman partook, till discovering the crime by finding the finger of her infant, she fled in frenzy to the forest, and there destroyed herself. On her death she was metamorphosed, according to the Buddhist belief, into an *Ulama* or Devil-bird, which still at nightfall horrifies the villagers by repeating the frantic screams of the bereaved mother in her agony."

I have been assured by gentlemen in Ceylon that the Owl which makes these wonderful noises is a small, whitish bird, and some have told me that they have seen it in the act of uttering them. This description would seem to indicate the next species, a bird until lately quite unknown in the island. The author just quoted publishes, in a footnote at page 248 of his 'Natural History of Ceylon,' a letter from Mr. Mitford, late of the Ceylon Civil Service, and one who took great interest in the birds of the island, from which it will appear that this gentleman was doubtful as to the identity of the Devil-bird. He says, "The Devil-bird is not an Owl. I never heard it until I came to Kurunegala, where it haunts the rocky hill at the back of Government-house. Its ordinary note is a magnificent clear shout like that of a human being, and which can be heard at a great distance, and has a fine effect in the silence of the closing night. It has another cry like that of a hen just caught; but the sounds which have earned for it its bad name, and which I have heard but once to perfection, are indescribable, the most appalling that can be imagined, and scarcely to be heard without shuddering. I can only compare it to a boy in torture, whose screams are being stopped by being strangled. The only European that had seen and fired at one agreed with natives that it is of the size of a pigeon with a long tail. I believe it is a Podargus or Night-Hawk." I believe myself that there is no doubt about the bird being an Owl, as none of the Nightjars in Ceylon ever utter notes at all resembling these cries. The natives, however, who brought me my young specimens of the Wood-Owl at Galle did not seem to know that they were the birds accredited with these noises, but simply called them *Bakkamūna*, or "Large Owl." Mr. Holdsworth, who was of opinion, from the description given him by natives of the Devil-bird, that it was an Owl, was fortunate enough to hear its cries one night in the Aripu district, but was unable to discern the author of them. While watching at a waterhole for the purpose of shooting bears, he was suddenly alarmed by piercing cries and convulsive screams suddenly issuing from a small patch of bushy jungle about thirty yards from his hiding-place. He says, "My hunter at first thought a leopard was there, and told me to keep quiet; but the cries increased, and became so horribly agonizing, that it was difficult to believe murder was not being committed. . . . . Before I reached the place all was silent as before, and the idea of the Devil-bird flashed across my mind. This was afterwards confirmed by the hunter, who, however, did not care to talk much about it." My readers will gather from the above summary of evidence that there does exist in Ceylon some nocturnal bird which utters very singular notes, but that it is not quite clear what the species really is. The natives at different times and different places have given me the most contradictory answers concerning the delinquent; but in many parts of the island they believe that it is the Brown Wood-Owl, and from them Messrs. Kelaart and Layard received the idea it was so, and hence the general idea current among Europeans as to the supposed

identity of this noisy bird of ill-omen. I endeavoured during my stay in Ceylon to discover whether these notes really were attributable to this bird or not; but, as regards my personal experience, I failed in finding out any thing satisfactory in the matter. My rearing up two of them (one of which I had in confinement for more than a year) did not assist me in my inquiries; for, as I stated in my article in 'Stray Feathers,' 1874, the only approach to any hoot which they made was a low growl, very seldom uttered, and a faint wheezy screech when they were very hungry; nor did they ever utter their far-sounding sonorous call, well known in the Ceylon hills, which resembles the syllables *to-whōōō*, repeated at short intervals. Owls do not, as a rule, give vent to their natural calls while in confinement; and I therefore do not consider my evidence in this quarter very conclusive. Since writing on this species, however, I have been assured by a gentleman who kept a pair of these Owls, one of which is now in the Zoological Gardens, that in 1875, and during the month of March, which is about their breeding-time, the pair alarmed the inmates of his house by uttering the most dismal and wailing cries imaginable; and although these notes were not described to me as being so horrible as they have been depicted above, I think this testimony is much in favour of the idea that in the breeding-season this bird does utter loud and singular cries, which in the dead of night fall with more than their real harshness of sound upon the ear. It still remains, therefore, for some one interested in the ornithology of the island to persevere in shooting the bird in the act of making these noises, and so settle the matter once and for all. Whether it be the present or some other species it is doubtless the case that these peculiar notes are only uttered during the breeding-season. In a state of confinement this Owl is any thing but an unpleasant bird. It has the power of almost erecting its dorsal scapulars and pectoral feathers when under the influence of emotion or surprise, and looks much like a porcupine in appearance when so doing.

The habits of my tame birds were exceedingly interesting, their quaint manners, grotesque bearing, and familiar actions rendering them daily objects of admiration. I therefore take up room to subjoin the following extract from the article above referred to, in which, after referring to the singular habit of revolving their heads, with their eyes fixed on the object of their attention, and then lunging them forward in order to gain a better sight of it, is written as follows:—"When given any thing of no great size to eat, such as a *Calotes* or small bird, it invariably seized it in its foot, grasping it with the outer toe to the rear, and holding it up after the manner of a Parrot, nibbled at various parts with a view of tasting it, after which it would suddenly jerk it into its mouth, head foremost, and swallow it without any exertion whatever. On the 10th June, when only three months old, it swallowed entire a large *Calotes* lizard; but this feat, I consider, was outdone by its companion, which I reared the following year, and which bolted, at the age of six weeks, a *Dicæum minimum* and *Cisticola schœnicola* with as much ease as if they had been small pieces of meat. This peculiarity of holding its food in the foot was very interesting to witness, the bird at these times, under the influence of pleasurable emotions, presenting a highly grotesque appearance, opening and slowly shutting its large eyes, and tasting the dainty bit with every now and then an epicurean snap of its mandibles. This, by the way, is performed by pressing the under mandible against the tip of the upper, and then letting it go with a snap against the basal edges of the latter. He delighted in a good wash, and took his bath almost regularly every day, flying over to the 'chattie' generally in the forenoon, and squatting down in the water, which he would throw over him on all sides; his ablutions took sometimes more than five minutes to perform, after which it was his custom to mount on a high perch, and hang down his wings until he was dry, presenting the most ridiculous aspect imaginable. He remained sometimes more than an hour in this position, feathering and pluming himself until able to fly about. The process of feathering was performed in general with the eyes shut; and it was interesting to watch the manner in which he would seize one feather after another without ocular assistance, leading them out from base to tip, and working them with a quick movement of the under mandible. Their powers of vision were not good on a dark night, and when young this was particularly noticeable." One which I kept in a box insisted on perching on the side all day, where it slept in peace; when tired it would lower its body until its breast rested on the wood, and in this position, with its head stretched out, it would remain for half an hour at a time. At sunset it became lively, snapping its bill loudly when approached, and displayed then, as the light decreased and objects became more perceptible to its vision, the singular habit of revolving or rotating and then darting out its head in the manner already mentioned. Fish was a favourite article of diet with these birds; they bolted good-sized "sardines" whole, in the same manner that they treated birds and lizards.

Nidification.—This Owl breeds in February, March, and April, and nests in the hole of a large tree; one of my young birds was taken from a cavity in the hollow of a lofty Hora (*Dipterocarpus zeylanicus*), the rotten wood at the bottom of which formed the nest. Two eggs brought to me from Baddegama as belonging to this species were very round in shape and pure white like other Owls' eggs; but they measured only 1·45 inch in length by 1·25 in breadth, and were too small for those of this species.

The figure in the Plate accompanying this article is taken from a male specimen shot in the Kandy district, and exemplifies the less rufous and more striated disk observable in hill-birds, as distinguished from those inhabiting the low country.

Genus PHODILUS *.

Of smaller size than *Syrnium*; disk more perfect above, with a patch of stiff feathers on each side of the anterior portion. Wings rounded, reaching to the end of the tail. Legs feathered. Toes covered with hairs; inner anterior toe longer than the outer one; middle claw slightly serrated, as in *Strix*.

PHODILUS ASSIMILIS.

(THE CEYLON BAY OWL.)

(Peculiar to Ceylon.)

Phodilus badius, Hume, Stray Feathers, 1873, p. 429; Whyte, ibid. 1877, p. 353.
Phodilus assimilis, Hume, Stray Feathers (Notes), vol. v. p. 137.
The Bay Screech-Owl, *apud* Jerdon.
Bassa, Sinhalese.

P. similis *P. badio*, sed saturatior et tectricibus exterioribus nigricantibus: primariis intùs nigricantibus nec rufis: plagâ subalari tectricum majorum nigrâ nec rufâ: plumis pectoralibus nigro bipunctatis.

Adult, presumed male (*vide* Plate). Length (from skin) 10·5 inches; wing 7·1; tail 3·5; tarsus 1·55; middle toe 1·1; claw (straight) 0·65; outer posterior toe 0·15.

Adult, presumed female (British Museum). Wing 7·8 inches.

Female. "Length 11·5; wing 8·12, expanse 27·5; tail 3·5; tarsus 2·0 (?); mid toe and claw 1·5" (*Whyte*).

"Iris dark brown; bill greenish white, with a dash of dark brown on edge of upper mandible, and dark spot on the nostrils; feet pale whitish green; claws pale ash, ridges of the scutæ of the toes of a darker green than the prevailing colour" (*Whyte*). Cere probably olivaceous.

Forehead and facial disk pallid reddish grey; loral plumes blackish at the base, the webs about the centres of the feathers rufous-brown; ruff-feathers white, very faintly tinged with rufous, and with a terminal black bar and the external tip rufous; crown and occiput with the back, scapulars, and lesser primary wing-coverts rufous, deepest on the head and slightly brownish on the other parts; feathers of the head with dark shafts and terminal black spots; a light buff patch on the centre of the occiput, on which the terminal dark spots are larger; back and sides of neck, inner webs of the scapulars and tertials, and the centre feathers of the median wing-coverts brownish buff; the buff feathers of the neck and wing-coverts with terminal brown spots, and the rufous portions of the back, together with the rump and upper tail-coverts, with a series of central, alternating white and black spots; least wing-coverts rufous-brown; outer webs of the primaries and secondaries, excepting the first primary, rufous, barred with black; inner webs blackish grey, barred with black; outer webs of the longer winglet-feathers and of the first primary white, barred with black; second and third primaries with the interspaces near the tip white; tail rufous, narrowly barred with eight wavy blackish bars, each feather with a white terminal spot enclosing a black one.

Throat and chest buff, changing on the breast, flanks, abdomen, and thighs into delicate rufous isabelline, each feather

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* This genus has hitherto been associated with *Strix* in the family of Strigidæ. Professor Milne-Edwards has, however, lately pointed out, in an article in the 'Comptes Rendus,' Dec. 1877, that its affinities structurally are with *Syrnium*. The posterior margin of the sternum is deeply cleft, the structure of the tibia is similar to that of this latter genus, the clavicle is also similar, and the skull differs in its formation from that of *Strix*. Its external appearance, however, is that of this latter genus, and the claw of the middle toe is, like it, serrated.

with two central spots on a white ground-patch; tibia fulvous-buff; tarsus isabelline, like the breast; lesser under wing-coverts buff; a large patch of brown marked with rufous at the edge or beneath the metacarpal joint.

The above is a description of the bird figured in the Plate. The example in the British Museum has the point of the wing, lesser wing-coverts, and inner webs of primaries darker still; it likewise has the rufescent feathers of the forehead spotted with dusky grey. The specimen described by Mr. A. Whyte in 'Stray Feathers' (vol. v. p. 354) has 9 bands on the tail; and both have the peculiar buff occipital patch, looking like the remains of immature plumage.

Young. The unfledged nestling is clothed with dusky grey down.

Obs. This is a well-marked distinct race of the continental and Malayan *Phodilus*; the differences between the two are slight, but they are well pronounced and constant; Mr. Hume, besides noticing the dark wing-coverts and wing-lining patch and the blackish inner webs of the quills which characterize the Ceylonese bird, remarks that it is smaller. I do not know whether as a species it will prove to be so. The wings of three examples of *P. badius* in the British Museum are as follows:—India, 7·7 inches; Malacca, 8·0; Sarawak, 7·1. Jerdon gives the wing of the example he described as 8·5. In the Norwich Museum are the following:—Java, w. 7·5 inches; Borneo, w. 7·4; Borneo, w. 7·5; Java, w. 7·4; Java, w. 7·5. On the whole, therefore, the balance is in favour of the Ceylonese bird. *Phodilus badius* differs from *P. assimilis* in having the head and back brighter rufous, in having the lesser wing-coverts, primary-coverts, and winglet concolorous with the back and not rufous-brown as in *assimilis*: these parts are not mottled with blackish; the inner webs of the quills are clear rufous, like the outer; the tail has only five or six bars; the feathers of the breast and belly have only one spot instead of two, and the patch under the wing is rufous instead of brown.

History and Distribution.—The present member of the interesting and little-known genus *Phodilus* is one of the most recently discovered of the peculiar Ceylonese birds. The first specimen on record was killed by a native about the year 1871, at a place called Lewelle Ferry, some three or four miles from Kandy. It was preserved by Messrs. Whyte and Co., of Kandy, and obtained from them by Mr. H. Neville, C.C.S., who sent it to Mr. Hume. To this gentleman is due the credit of discriminating our species, on the testimony of this example, from the Indo-Malayan bird *P. badius*. In November 1876 a second example (the skin of which, through the kindness of Mr. W. Ferguson, passed into my hands, and is now in the collection of the British Museum) was captured by a coolie on the Martinstown Estate, Kukkul Korale. It was taken from the nest together with three young ones; and Mr. H. B. Hector, to whom I am indebted for much information on the subject, and on whose estate the birds were caught, writes to me that the Sinhalese brought another bird of the same species to his superintendent, but there being no accommodation for it at the bungalow it was released. In February 1877 a third specimen was procured by Mr. Reeves of Ratota, and its capture recorded by Mr. A. Whyte at p. 201 of vol. v., 'Stray Feathers;' while at p. 353 of the same vol. Mr. Whyte notices a fourth caught in the following July on the estate of Mr. Weldon, Dickoya, who states, in his letter to Mr. Whyte, that it was the second of the kind which his cooly had caught. There appear, therefore, to have been, as far as I can ascertain, six examples* of this rare Owl shot or captured in Ceylon, showing that its range extends throughout the hill-regions of the island, and that the habitat, as far as is yet known, of the bird lies between 1500 and about 3000 feet elevation. Future research will, however, doubtless reveal its presence both in the low country and in the upper hills; and it is to be hoped that hereafter all examples met with will be both preserved and recorded with data of sex and measurements in 'Stray Feathers' or other ornithological publications.

Habits.—This recently discovered nocturnal denizen of our forests has come to such a limited extent under any one's notice, that it is not in my power to place on record much concerning its economy. It has shown itself to be an inhabitant of forest-jungle, out of which it evidently strays at nights in search of food, and, like many other Owls, when unable or too late to return to its usual haunts, hides where it best can on

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* Mr. Hume writes me, since this was penned, that he has received two additional specimens from Ceylon.

estates, in isolated trees or in old buildings, and, owing to its completely nocturnal habits and imperfect day-sight, falls an easy victim to any one with eyes sharp enough to discover it. Mr. Reeves's specimen was taken in an old cooly hut. Mr. Weldon writes, as above mentioned, to Mr. Whyte :—"This bird was caught by a cooly in a tree in the daytime on my estate, and is the second of the kind he has caught here. It was put on a perch in a dark room, but refused to eat, and died after two or three days' confinement." The bird brought by natives to Mr. Hector's superintendent appears to have been taken the same way, being the third instance of capture by hand during the day. Mr. Hector, in a letter kindly written to me after my departure from Ceylon, throws some light on the nature of this Owl. He says, in speaking of the brood of young birds, "there were three apparently of different ages, as the largest very much exceeded the other two, which also differed considerably in size. The largest one was about the size of our ordinary Quail, with a flattish-shaped head. It seemed a vicious bird, as it used to peck the other two continually, and one day, I found, had pulled many of the feathers out of the smallest, and seemed to be trying to tear its flesh, so that I had to separate them." Unlike most Owls, it does not seem to thrive in confinement. Mr. Hector kept the parent bird of these young ones five weeks; but in Mr. Weldon's case, his lived but two days. Mr. Reeves writes me concerning his bird that it lived about a week and was fed on lizards and small fish caught in a neighbouring stream, and preferred the latter to any thing else. With regard to the note of this species, it may or may not be the author of the hideous sounds attributed to the Devil-bird; but I have no authentic information as to any of its cries. Of the allied species, *P. badius*, Messrs. Mottley and Dillwyn, as quoted by the late Mr. Blyth in the 'Ibis' for 1866, p. 252, state :—"It has only a single note, frequently repeated, and which is much like the first note of the common Wood-Owl's cry."

Nidification.—The Ceylon Bay Owl appears to breed at the latter end of the year, nesting in hollow trees. Mr. Hector writes me that "the nest was made in a hole in a tree and composed of dry twigs, moss, and feathers." The number of eggs in this was three, so that they may be inferred to vary from two to four, as in some other species of Owls.

For the loan of the specimen figured in the Plate accompanying the last article I am indebted to the kindness of Mr. Reeves and his brother-in-law Mr. J. C. Horsfall, in whose house at Altrincham it is mounted. I was unable to figure the example presented to the British Museum, as the tail is not perfect. Mr. Keulemans has drawn this Owl with the wings slightly drooped, in order to show the characteristic dark inner portions of the quills.

Fam. STRIGIDÆ.

"Hinder margin of sternum entire, with no distinct clefts; furcula joined to keel of sternum; inner margin of middle claw serrated; inner and middle toes equal in length; between the anterior portion of the facial area a frontal patch of small stiff feathers always present and very broad." (*Sharpe*, Cat. Birds, ii. p. 289.)

ACCIPITRES.

STRIGES.

STRIGIDÆ.

Genus STRIX.

Hinder margin of sternum entire, with no distinct clefts; furcula joined to keel of sternum. Head smooth. Bill straight at the base, compressed, feeble, with the tip much curved. Nostrils large, oval, and oblique. Facial disk complete and entirely surrounded by a ruff of stiff feathers. Wings long in comparison to the tail, pointed, with the 2nd quill the longest, and the 1st subequal to the 3rd. Tail even. Legs long; the lower part of tarsi clothed, as the toes, with bristles. Toes long and scutellate above; claws much curved, the inner edge of the middle *serrated.*

STRIX FLAMMEA.

(THE BARN-OWL.)

Strix flammea, Linn. S. N. i. p. 133 (1766); Gould, B. of Eur. i. pl. 36; Blyth, Cat. B. Mus. A. S. B. p. 41 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 81 (1854); Schlegel, Vog. Nederl. pl. 41 (1854); id. Mus. P.-B. *Striges*, p. 1; Gould, B. of Gt. Brit. i. pl. 18; Sharpe, Cat. Birds, ii. p. 291 (1875); id. in Rowley's Orn. Miscellany, pt. viii.

Strix javanica, Gm. S. N. i. p. 295; Jerd. Madr. Journ. x. p. 85; Blyth, J. A. S. B. xix. p. 513; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 82; Jerd. B. of Ind. i. p. 117; Hume, Nests and Eggs Ind. B. p. 59; Kelaart, Prodromus, Cat. p. 116; Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 107.

Strix indica, Blyth, Ibis, 1860, p. 251; Hume, Rough Notes, ii. p. 342; Gould, B. of Asia, pt. xxiv.; Holdsw. P. Z. S. 1872, p. 415; Hume, Str. Feath. 1873, p. 163, et 1875, p. 37.

The White Owl, Albin; *Le petit Chat-huant* (Brisson); *L'Effraye*, Buffon; *The Screech-Owl*; *The Indian Screech-Owl* (Jerdon). *Lechuzo*, Spanish.

Karaya, *Karail*, Hind., also *Buri-churi*, lit. "bad bird;" *Chaao pitta*, Tel.; *Chaao kuravi*, Tam. (Jerdon); *Daris*, Java (Horsf.); *Serrak*, Malays (Horsf.).

Adult male and female. Length to front of cere 13·8 to 14·0 inches; culmen from cere 1·0; wing 11·4 to 11·7; tail 4·3 to 4·7; tarsus 2·4 to 2·6; mid toe 1·3 to 1·4, its claw (straight) 0·75 to 0·83.

Obs. The above measurements correspond fairly with those of Indian and Burmese birds, and are taken from a series of specimens. The measurements of six examples from the above localities are:—Total length 14·0 to 14·8 inches; wing 11·0 to 11·8; tarsus 2·5 to 2·75. The expanse of Indian birds, according to dimensions contained in 'Stray Feathers,' varies from 38·0 to 39·7.

Iris black; bill fleshy white; cere flesh-colour; bare portion of tarsi and feet fleshy brown; claws brown.

General hue of upper surface, including the tail and wings, rich tawny buff, the visible portions of the feathers profusely and finely stippled with whitish and dusky grey, and each with a terminal white spot, "pointed" above with blackish brown; on the head and hind neck the white portion of the spot is inconspicuous, and the dark very much reduced in size; on the rump, tertials, and quills the tippings are more extensive than elsewhere; edge of the wing and outer web of the first winglet-feather white; inner webs of the primaries and secondaries

whitish towards their edges, and crossed on the terminal half with broken-up brownish bars; outer webs and tips mottled like the back with traces of bars corresponding to those of the inner webs; a white, dark-edged spot at the tips of the quill-feathers, most conspicuous on the tertials; tail crossed with four narrow, wavy bars of brown, mottled with whitish; the tip white, mottled with brown, and terminated with a black-and-white spot.

Facial disk white, speckled in some with grey; a rufous patch in front of the eye; ruff (of stiff, erect feathers) glossy white interiorly, rich rufous at the tips of the exterior feathers, which are also pencilled round the edges with brown; sides of the neck concolorous with the back, the feathers with terminal greyish-bordered spots; throat and under surface white, faintly tinged here and there, and more particularly on the flanks and tibia, with delicate buff; feathers of the flanks and sides of the breast with dark triangular terminal spots; under tail-coverts in some spotted, in others entirely white. Under wing-coverts and lower surface of quills white; the lesser coverts with blackish spots and dashes of buff.

Obs. Some Ceylonese specimens are of a richer or more orange-buff than others, and in all that I have examined is the tail concolorous with the back. The spottings of the under surface are always present, in a greater or less degree, some examples having the belly and thighs as much marked as the breast. I have not seen any traces of zigzag markings in Ceylon birds, and thus they possess more affinity to the Indian than to the Malayan type of this variable species. The plumage of this Owl fades considerably with the age of the feathers and perhaps from exposure to the sun's rays. Such a specimen I possess in my collection, the appearance of which would suggest the idea that the bird had selected an exposed situation wherein to roost. The buff tint has entirely disappeared from the exposed portion of the upper-surface feathers, and the dark spots are very pale. The feathers in this example are much abraded throughout.

Young. In the European bird the nestling is covered with white down, the wing-feathers having the normal buff hue, with greyish and white mottlings.

Young bird on leaving the nest (Sharpe, Cat. Birds, ii. p. 293).—" General colour above orange, but profusely obscured with light grey, all the latter plumes vermiculated with ashy brown and having a distinct subterminal white spot margined both above and below with brown; the head and hind neck coloured like the back, but more decidedly orange, especially the sides of the neck, which are bright orange with a few bright spots; wing-coverts coloured like the back; primary-coverts orange, mottled at the tips like the rest of the coverts, but much paler externally and inclining to whitish; quills orange, mottled at the tips with greyish, and having distinct cross bars of grey mottled with white; tail pale orange, barred with greyish and mottled with the same.

" Facial disk silvery white, the feathers rufous round the eye and especially in front of the latter; ruff glistening white, the upper plumes washed with orange, and the lower ones also tipped with clear orange; feathers of the under surface pure white, tinged with orange on the chest, but not spotted."

Distribution.—This cosmopolitan and well-known bird is an inhabitant of the north and north-west coasts of Ceylon. The natives have, my friend Mr. W. Murray informs me, a tradition among themselves that it was introduced by the Dutch. I will not venture to pronounce an opinion on this point, but will simply remark that its range is extremely limited. Layard only noticed it at Jaffna, where it used to be common about the fine old Dutch fort, living in the ramparts; it was tolerably numerous there, Mr. Murray writes me, until about ten years ago; since then its numbers, which were always limited, have been thinned by people collecting, and by the birds occasionally being caught abroad in the daytime by the Jaffna Crows, and quickly treated to lynch-law by these tyrannical citizens. It inhabits some old buildings in the neighbourhood of the town, and has been met with in the fine banyan-tree on the road to Chavakacheri. It no doubt frequents other ruined buildings along the coast to Manaar, in which district Mr. Holdsworth records it from Aripu. Further south it has been found at Puttalam, where Mr. R. Pole, of the Ceylon Civil Service, informs me he has seen it. I am not aware that its range extends lower down the coast than this latter place. On the opposite coast it is not known.

The Barn-Owl inhabits India, Siam, and Malayana, and extends eastward to Arabia. As regards the other continents of the globe it may be said (now that the many races hitherto recognized have been amalgamated into the one species by Mr. Sharpe) to be found in all of them. It is generally distributed throughout Europe and Africa, extending, in its race of *S. poensis*, to the island of Madagascar and to the Cape Verds. In America the western form *S. pratincola* is distributed throughout the North-American, West-Indian, and Neotropical Regions, as far south as Chili, and extends over to the Galapagos Islands. In the Australian Region

it is represented by *S. rosenbergi* from Celebes, and by *S. delicatula* from Australia and a portion of Oceania, but not from Tasmania or New Zealand—the latter locality being without any member of the genus, while Tasmania is inhabited by the large race (*S. castanops*) of the Australian species *S. novæ-hollandiæ*.

Habits.—As in the old country, the Screech-Owl, or, as it is better known, the "Barn-Owl," frequents, in Ceylon and India, ruined edifices, forts, wells, and buildings of every description, preferring these architectural retreats to those afforded by old and hollow trees. It, however, sometimes takes up its abode in the latter. In Jaffna Mr. W. Murray, who resided there for many years, and had abundant opportunity of noticing its habits, writes me that it "lives in the small square drains leading from the silt-traps on the bastions to the moat.". . . . . "At dusk," he remarks, they sit at the openings overlooking the moat, and screech to one another for a good half-hour before starting on their foraging expeditions; many feed about the fort, but some fly across the Jaffna lake to the islands in search of food." Mr. Holdsworth found them frequenting a storehouse in his compound, "each regularly perching in a dark corner under the roof, at opposite ends of the long building, and apparently living in harmony with hundreds of Bats which hung from the roof and walls around." In India, Jerdon found them frequenting cells and powder-magazines in the vicinity of cantonments, and it therefore appears that in the East, as well as in Europe, it loves to haunt the habitations of man. In such localities it has opportunity of doing good in the capture of rats and other noxious vermin, enormous quantities of which it must destroy in a single year. Most people who take any interest at all in the natural history of birds now absolve the inoffensive and useful Barn-Owl from the sins which used to be laid at its door, and instead of accusing it of destroying birds, game, &c., are aware that it is a vermin-killer, and does far more good than harm. The old story is well known of the farmer, who, missing his pigeons one by one, laid in wait for the fancied robber, the Barn-Owl, and, having shot the unfortunate bird issuing from the dove-cot, was surprised to find a huge rat, the real depredator, in the bird's talons. Dr. Jerdon affirms, in his 'Birds of India,' that he has known it more than once fly into the room in which he was sitting with open doors and windows after a rat which had entered.

The note of the Screech-Owl, as its name implies, is a loud cry or scream, which it sometimes utters on the wing, in addition to which it is said by Indian observers to utter doleful wailings and sounds, such as are generally believed to be solely the voice of the Wood-Owl (*Syrnium*). Mr. J. H. Rainey, a writer in 'Stray Feathers' (vol. iii. p. 333), relates that he has often been awakened "by cries which closely resembled two infants in distress," and on following the bird has shot what he identified as the Indian Screech-Owl. These occurrences took place at the end of the cool season, before the birds began to breed, and were, doubtless, says Mr. Rainey, their amorous calls or love-notes. It is the habit of this Owl to issue out from its roosting-place at dark; but I have more than once seen English members of the species abroad before sunset even. In confinement they sleep throughout the whole day, which cannot be said of some Owls (see my remarks on the Ceylon Wood-Owl); and I have seen a caged bird outside a shop window, in one of the most crowded thoroughfares in London, fast asleep, totally unconscious of the din and roar going on around him. Mr. Holdsworth, who observed the habits of a pair that frequented a storehouse in his compound at Aripu, never observed them abroad until some time after sunset.

The habits of this Owl in confinement are very interesting. They are voracious in their appetites, and very fond of bathing. Mr. Blewitt, as quoted in 'Nests and Eggs,' p. 59, remarks of some he reared, that they would invariably *disgorge* the flesh of Hawks and Owls that had been given them to eat.

Nidification.—In Jaffna, I understand, this Owl breeds in June and July, nesting in the drains in the escarpments of the Fort ditch, without fear at that time of their nests being washed away. In India they breed from February to June; and Mr. Hume observes that holes in wells are the favourite localities; the nests are, however, often found in hollow trees, where there are no suitable buildings to be chosen. The eggs are usually laid on the bare surface of the cavity*, but sometimes a small stick-nest is made, which, says Mr. Hume, resembles that of a Pigeon. The number of eggs is variously stated as from three to seven, the latter being no doubt unusual. They are generally pure white, but sometimes have a

* In England I have found the eggs on the bare stone at the top of a barn wall.

creamy tinge. Mr. Hume says that the eggs of the Indian birds are more oval than those of the European. The average size is 1·69 by 1·28 inch. In Europe it is found that this Owl lays occasionally a second and third clutch of eggs before the first brood leaves the nest, these latter, as Professor Alfred Newton remarks, materially aiding the development of the unhatched chicks during the nightly absence of the parents in search of food*.

* Yarrell's 'British Birds,' 4th edition, p. 197.

Order PSITTACI.

Base of upper mandible covered with a cere, in which the nostrils are pierced, as in *Accipitres*; upper mandible vaulted, much curved, the tip overhanging the lower, which is short and rounded. Wings with ten primaries. Tail with twelve rectrices. Legs short. Feet zygodactyle.

Sternum large, much as in *Accipitres*, but narrower, and with an oval aperture in the posterior edge; cranium very large. Œsophagus dilated. Tongue fleshy. Of gay plumage.

Fam. PSITTACIDÆ.

Bill with the upper mandible wide at the base, suddenly compressed near the tip; margin with a well-pronounced lobe; under mandible short and obtuse. Wings moderately long. Tail variable. Tarsi covered with small tubercle-like scales.

Subfam. PALÆORNINÆ.

Bill moderate, the upper mandible moderately hooked. Tail very long and wedge-shaped; the central feathers far exceeding the rest, which are much graduated. Legs and feet proportionately small.

Of medium size.

PSITTACI.

PSITTACIDÆ.

PALÆORNINÆ.

Genus PALÆORNIS.

Bill rather short; upper mandible evenly curved from the base, the tip moderately produced; the margin furnished with a rounded indentation; the cere small, nostrils pierced close to the culmen; under mandible short. Wings moderately long; 2nd quill the longest, 1st and 3rd slightly shorter. Tail very long, the central feathers usually produced much beyond the next two. Tarsus very short and finely reticulated. Outer anterior toe longer than tarsus; outer posterior toe longer than the inner anterior one; claws rather straight and short.

PALÆORNIS EUPATRIUS.

(THE ALEXANDRINE PARRAKEET.)

Psittacus eupatrius, Linn. Syst. Nat. p. 140, ♀ (1766).

Psittaca ginginiana, Brisson, Orn. iv. p. 343, pl. 29. fig. 1, ♀ (1760).

Palæornis alexandri, Vigors, Zool. Journ. ii. p. 49 (1825); Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. p. 208; Blyth, Cat. B. Mus. A. S. B. p. 4 (1849); Kelaart, Prodromus, Cat. p. 127 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 262; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 610 (1856); Jerdon, B. of Ind. i. p. 256 (1862); Finsch, Papageien, p. 11 (1868); Holdsw. P. Z. S. 1872, p. 425; Hutton, Str. Feath. 1873, p. 333; Legge, Ibis, 1874, p. 14.

Palæornis eupatrius, Walden, Ibis, 1873, p. 297; Hume, Str. Feath. 1873, p. 433; Ball, Str. Feath. 1874, p. 389; Legge, ibid. 1875, p. 199; id. Ibis, 1875, p. 282.

Palæornis magnirostris, Ball, Str. Feath. 1873, p. 66; Hume, Str. Feath. 1874, p. 176.

The Ring Parrakeet, Edwards, Glean. vol. vi. pl. 292 (1760); *The Alexandrine Parrakeet*, Latham; *Grande Perruche aux ailes rougeâtres*, Buffon, Hist. Ois. vi. p. 156; *Rose-band Parrakeet* of some.

Ra-i-tota, lit. "Royal Parrakeet," Hind. in south of India; *Pedda chilluka*, Tel.; *Peria killi*, Tamils in India and Ceylon; *Chundanon*, in Maunbhoom (Beavan).

Laboo girawa, Sinhalese.

Adult male. Length to front of cere 18·0 to 19·5 inches; culmen from cere 1·55; wing 7·8 to 8·2; tail 11·0 to 12·0; tarsus 0·75; outer anterior toe 1·0, its claw (straight) 0·45; depth of upper mandible at cere 0·73 to 0·78. The bill varies in depth; in old birds the lobe gets worn away, and in others I have observed that one side of the bill is higher than the other.

Iris yellowish white or very pale yellow, with a bluish-grey inner circle; eyelid dull reddish; bill deep cherry-red, paler on the lower mandible, and the tips of both somewhat yellowish.

Legs and feet greyish sap-green, or greenish plumbeous, or plumbeous grey; claws dusky. Above grass-green, brightening to emerald-green on the forehead and lores, and darker on the wings; a faint blackish stripe from the nostrils

to the eye; occiput and cheeks pervaded with a greyish-blue tinge; a broad black mandibular stripe passing down and across the side of the neck, where it meets a rose collar which encircles the hind neck; on the secondary wing-coverts a dark red patch; 1st primary and inner webs of remaining quills dark brown, the former with a bluish and fine yellow edge; bases of secondaries washed with blue; central tail-feathers passing from the base into blue, and thence into yellowish at the tips: under surface of tail yellowish; beneath dingy or faded green, brightening on the lower flanks and sides of the abdomen; under wing and under tail-coverts pale green.

Female. Total length 17 to 18 inches; wing 7·5 to 7·8; tail 9·0 to 10·0; greatest depth of upper mandible 0·7. Iris dingy yellowish white, with darkish inner circle; bill, legs, and feet as in male.
The female wants the black mandibular stripe and rose collar.

Immature male. Similar to the female in plumage, but generally larger, attaining a total length of about 19 inches in the first year. In some the rose collar is present in an imperfect state: but these are probably birds of the second year. The iris is greenish white generally.

Obs. The Ceylonese race of this Parrakeet is, like many other representatives of Indian species inhabiting Ceylon, smaller than the continental; for although very large examples of males are sometimes met with, this sex is, as a rule, shorter in the wing and tail, and possesses a smaller bill than most members of it from India, while a still greater disparity exists between individuals of the other sex from the two localities. Three adult males from peninsular India and the N.W. Provinces in the national collection measure in the wing 8·3, 9·2, and 8·2 inches, and the tail in the second attains as much as 13·4, with the bill 0·85 in height at the cere; the mandibular stripe in some Indian individuals is very broad. Mr. Ball gives the wing-measurements of 2 males from Chota Nagpur as 8·65 and 8·5, and those of the tail 11·6 and 12·0; the corresponding dimensions of two females from the same district are 8·2, 8·35, and 12·2, 12·0. In the north and north-west of India a race exists with a glaucous blue tinge on the head, and likewise larger than the Ceylonese, which Mr. Hume considers deserving of subspecific rank under the title of *Pal. sivalensis* of Hutton. In Burmah and the Andaman Islands another is characterized by its larger bill as *P. magnirostris* of Ball. This latter is no larger in the wing than Indian examples, but as regards the bill the upper mandible attains, in some instances, the great height at cere of 0·96. Lord Tweeddale, however, received individuals from this locality smaller in the bill than Ceylonese; and though Mr. Hume remarks that these were probably females, yet they must have been compared with individuals of the same sex from Ceylon.

Distribution.—This fine Parrakeet is a common and widely diffused species in Ceylon. It appears to be as much entitled to the name of Alexandrine Parrakeet, in memory of the great Emperor whose voyagers brought it from the East, as the Indian bird; for it would be difficult to assign the true locality whence it was first procured in those days of yore. The old writer Willughby, in his 'Ornithology,' published in 1678, remarks of this species, which he calls the "Ring Parrakeet of the ancients":—"This was the first of all the Parrots brought out of India into Europe, and the only one known to the ancients for a long time, to wit, from the time of Alexander the Great to the age of Nero, by whose searchers (as Pliny witnesseth) Parrots were discovered elsewhere, viz. in Gagandi, an island of Ethiopia." Edwards says that his plate was taken from a specimen brought alive to London in one of the East-India Company's ships.

To return, however, to its distribution in Ceylon, it is found throughout the north of Ceylon, from Chilaw upwards, more particularly along the seaboard round to Batticaloa, where it is very abundant indeed. In some portions of this long line of coast its presence is notably wanting; for instance, at Trincomalie it is rarely seen, although 15 miles to the north of it and on the south of the Bay it is common. In the jungles of the interior it is locally distributed. In the south-east I found it tolerably plentiful in the Wellaway Korale, from which locality it ascends in the dry season to the Haputale ranges. In the scrubby maritime district of Hambantota it is replaced by the next species. It occurs here and there in small numbers throughout the southern and western Provinces, and in the Kandyan district is not unfrequently met with in the dry season; and in Madulsima I have seen it as high as 3500 feet. Mr. Bligh has observed it on one occasion at Nuwara Elliya. It is tolerably numerous along the base of the Matale ranges from Dambulla to Kurunegala.

In the Peninsula of India it is found, according to Jerdon, in the forests of Malabar, in the hilly region of Central Indian, and in the northern Circars, and occasionally in parts of the Carnatic; in the extreme

south it is not nearly so common as *P. torquatus*. In Chota Nagpur it is, according to Mr. Ball, by no means universally distributed, but in the Rajmahal hills is much more common. Mr. Fairbank does not record it from Khandala, and in northern Guzerat it is rare. In the sub-Himalayan region it is common as the *P. sivalensis* of Hutton, and in Burmah exists as the large-billed race *P. magnirostris*, which extends through Tenasserim to the islands of the Bay of Bengal.

Habits.—Large colonies of this species take up their abode in districts where cocoanut cultivation borders on forest and wild jungle, which afford an abundance of fruit-bearing trees, on the berries of which the Alexandrine Parrakeet subsists. It is also found in openly timbered country and in forest. It roosts in considerable numbers in cocoanut-groves, often close to a village, pouring in about half an hour before sunset in small swiftly flying parties from all directions, which, as their numbers increase towards the time for roosting, create a deafening noise in the excitement of choosing or finding their accustomed quarters. The fronds of the cocoanut afford them a favourite perch, on which they sleep huddled together in rows. At daybreak the vast crowd is again astir, and after much ado, flying from tree to tree with incessant screaming, small parties start off for their feeding-grounds, flying low, just above the trees, and every now and then uttering their full and loud note *ke-āār*; this sound is more long-drawn and not so shrill as that of the smaller bird, and can be heard at a great distance. Isolated birds have a habit of apparently leaving the rest of the flock and roaming off at a great height in the air, every now and then giving out a loud scream, which often attracts the attention of the traveller or sportsman for some little time before he is aware of the position of the Parrakeet, which is flying swiftly on far above his head. It is a shier bird than its smaller congener, and rather difficult of approach when not engaged in feeding or in the business of settling down for the night; at the latter time numbers may be shot without their companions doing more than flying out of, and directly returning to, their chosen trees. In the forests of the south-eastern part of the island I observed these Parrakeets resorting at evening to dead and sparsely foliaged trees, the bare branches of which afford them a similar perch to that of the palm-frond.

They feed on grain as well as on the fruits and berries of forest-trees; and I on one occasion captured a fine specimen which had become entanged in a species of vetch which covered the earthy portions of a rocky islet near Pigeon Island; it had been feeding on the seeds of the plant, and while extracting them from the pod had got beneath the tangled mass and was unable to extricate itself again. In confinement this species is possessed of the usual docility peculiar to the Parrot order, and is a very favourite pet in Ceylon with both Europeans and natives; I do not think it is as often taught to imitate the human voice as the next species, but I have heard it occasionally speak native words with a fair amount of distinctness. Indian writers say that it is taught with facility to speak; but I think that as a general rule in Ceylon it is kept more as an ornament than for its powers of talking, and when newly feathered, with its tail in perfect order, is a very handsome bird.

Nidification.—Layard writes that he was informed by natives that this bird laid two eggs, building, of course, as all Parrakeets, in a hollow tree. It excavates the hole in which it breeds, generally choosing a small limb, of which the hard shell to be cut through before reaching the interior cavity is not very thick. I have never succeeded in getting the eggs, and therefore can state nothing certain concerning their size. Mr. Hume gives the dimensions of one belonging to the Northern-Indian form, *P. sivalensis*, as 1·52 by 0·95 inch, a very unusual shape for the egg of a Parrakeet, which is generally round. Mr. Rainey writes in 'Stray Feathers,' concerning the breeding of the Rose-band Parrakeet in the Sunderbunds, that "they build their nests in the hollows"—of trees with light wood—"first scooping them down perpendicularly some two and a half feet, so that it requires a long arm to be able to remove the nestlings within . . . . The eggs are usually two or three and sometimes four in number, and are deposited in the end of the hollows, the scrapings of the wood being gathered below to form a soft bed for them and the young when hatched."

PALÆORNIS TORQUATUS.

(THE ROSE-RINGED PARRAKEET.)

Psittacus torquatus, Bodd. Tabl. Pl. Enl. p. 32 (1783).

Psittaca torquata, Brisson, Orn. iv. p. 323 (1760).

Psittacus alexandri, Linn. Syst. Nat. p. 141 (1760).

Palæornis torquatus, Vig. Zool. Journ. ii. p. 50 (1825); Sykes, P. Z. S. 1832, p. 96; Jerd. Cat. B. S. India, Madr. Journ. 1840, xi. p. 207; Blyth, Ann. & Mag. Nat. Hist. 1840, xii. p. 90; id. Cat. B. Mus. A. S. B. p. 4 (1849); Gray, Cat. Mamm. &c. Nepal Coll. Hodgs. p. 113 (1846); Kelaart, Prodromus, Cat. p. 127 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 262; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 611 (1856); Jerdon, B. of Ind. i. p. 257 (1862); Holdsworth, P. Z. S. 1872, p. 425; Hume, Str. Feath. 1873, p. 170; id. Nests and Eggs, Rough Draft, p. 116 (1873); Ball, Str. Feath. 1874, p. 389; Legge, Ibis, 1874, p. 14, et 1875, p. 282; Butler, Str. Feath. 1875, p. 457.

La Perruche à collier, Buffon, Pl. Enl. p. 551; *Alexandrine Parrakeet*, Latham; *La Perruche à collier rose*, Buffon, Hist. Oiseaux; *The Rose-collared Parrakeet*, Kelaart; *Mango Parrot* in India; *Small Green Parrot* and *Ring-necked Parrakeet*, Europeans in Ceylon.

Tiya, Bengal; *Gallar*, Hind. in N.W. Provinces; *Tenthia suga*, Nepal; *Lybar*, Mussooree; *Ragoo* and *Kerah*, Mahrattas; *Lybar tota*, Hind. Shikarees in South; *Chilluka*, Telegu; *Killi*, Tamil; *Teea-tota*, natives of Maunbhoom.

Rana girawa, Sinhalese.

Adult male. Length to front of cere 13·5 to 16·1 inches; culmen 1·1; total length of the latter 1·72; wing 6·0 to 6·6; tail 8·2 to 9·8; tarsus 0·5; outer anterior toe 0·95, claw (straight) 0·38; greatest height of upper mandible 0·5. Adults of this Parrakeet vary extraordinarily in size, evidently attaining the maximum dimensions when several years old. The smaller of the above measurements, which are taken from a series of Ceylonese birds, are those of an individual in fully adult dress.

Iris yellowish white or white tinged faintly with yellow; bill, upper mandible deep red, margin at gape and lower mandible blackish; legs and feet dusky bluish slate or greenish olivaceous, often with a brownish wash on the tarsus.

Above and beneath grass-green, with a greyish wash on the hind neck and chest, and the lower parts more delicate than the back; a well-defined blackish streak from nostril to eye; a black mandibular stripe, meeting on the gorge, and curving round as in the last to meet a collar of pale red on the hind neck (the black and red overlap more than in the last species); occiput and hind neck above the collar with the upper edge of the black stripe at the cheek washed with delicate azure-blue; inner webs of quills brown, with a fine yellowish edging to both webs; the central rectrices and outer webs of next pair are blue, fading towards the base to green; the rest green, washed on the inner webs with yellowish; tips and under surface of all the feathers yellowish; under wing yellowish green; tertiary under-coverts yellow.

Female. Total length about 16·0 inches; wing 6·0. Soft parts as in male.

Similar in plumage, but wants the black stripe and rose collar, in place of which latter it has a narrow emerald-green band across the hind neck.

Young. The nestling is similar to the female, and males attain in the first year a size quite equal to adults of the other sex. There is a dusky indication of the black stripe. and on obtaining the dress of maturity the feathers above the green collar become edged with rose, and a narrow edging of black begins to appear where the broad black stripe eventually is put on. At the same time the hind neck becomes tinged with azure-blue.

Obs. Ceylonese examples of this Parrakeet average smaller than Indian. I have not met with a male which exceeded

6·6 in the wing, the usual size being 6·3, while several which I have examined from various Indian localities, such as Kamptee, Mysore, Hyderabad, &c., measure as much as 6·7; they are, however, no larger in the bill than insular examples, the measurements of this organ in several being 0·45, 0·43, 0·46 (height at front). The finest specimens I have seen in Ceylon were from the north; I noticed, on the contrary, that Hambantota birds were smaller than those from other parts of the island.

Distribution.—This pretty Parrakeet is very abundant in the districts which it affects; it is an inhabitant of all the dry low-country parts of Ceylon, and is more abundant on the seaboard and the adjacent maritime regions than in the interior. It is very partial to the cocoa-nut and palmyra districts on the east and north coasts; commencing, therefore, at the Jaffna peninsula, where it is common, we find it more or less plentiful down the east coast and round the east corner of the island to the Girawa Pattu, or "Province of Parrots," beyond the western boundary of which it is rarely seen. From there up the west coast, as far as the district immediately to the north of Negombo, it is absent; here it reappears again, and is very abundant about Chilaw, where it was noticed particularly by Layard, likewise at Puttalam and throughout the Seven Korales to the base of the Kurunegala and Matale hills, along which it is tolerably numerous. Along the west coast to Manaar, and thence northward to Jaffna, it is very common. It occurs in suitable localities throughout the northern forest tract, and in portions of the Park country, as well as at the base of the Medamahanuwara, Madulsima, and Haputale ranges, but I do not know of its ascending to any elevated patnas.

This species is common throughout all India, from the south of the Madras Presidency to the foot of the Himalayas. It is a denizen of the low-lying parts of the country as in Ceylon; for I do not find it recorded from any elevation of consequence either in the north or south. Its range extends into the north-western parts of India. Captain Butler notices it as very common in Northern Guzerat, as well as on Mount Aboo, and Mr. Hume the same as regards Sindh. In Burmah it is likewise common, and extends down the peninsula to the latitude of Penang. It was introduced into the Andaman Islands by Col. Tytler, but Mr. Hume says it has now entirely disappeared. It is also found in North-eastern Africa and Senegambia.

Habits.—The Rose-ringed Parrakeet frequents openly-timbered plains, scrubby land in the vicinity of cocoanut cultivation, low jungle along the sea-coast, and, in fact, all localities where it can obtain an abundance of wild berries and fruit to subsist on. Like the last species it assembles in flocks, but of far greater number, to roost among the cocoanut-trees, often in the midst of a village, and even, as at Trincomalie, in the centre of a town. It commences to return from its feeding-grounds at an early hour; and often about 4 o'clock in the afternoon I have watched little troops of a dozen or more glancing over the tops of the trees, and sweeping across open places in the jungle, or twisting through a palmyra-grove with surprising quickness, towards their evening haunt, their light green plumage glittering in the rays of the declining sun, while the foremost of the flock uttered his shrill but not unpleasant note, as if to cheer his companions on. In the early morning it is marvellous with what celerity they spread themselves over the whole surrounding country, branching off in little parties, probably the same which returned together on the preceding evening, as if they were resolved to reach a certain spot by a given time or they would find their breakfast vanished!

They feed for about three hours, and then towards 10 o'clock settle about in twos and threes in the thick foliage of shady trees, and remain silent, suddenly darting off with a scream when disturbed. They are very difficult to see when seated thus among leaves, and unless they were to fly off on the approach of man, would with difficulty be observed. In the evening they become, like the last species, regardless of a gun, and are often shot in large numbers by the natives, who wait beneath the trees as they return to roost. They feed chiefly on berries, but they can, as Jerdon remarks, be very destructive to grain. Burgess, as noted by the Doctor in his 'Birds of India,' remarks that they carry off the ears of corn to trees to devour at leisure. When looking for a tree in fruit, I have seen them, as Jerdon noticed, "skimming close to and examining every tree; and when they have made a discovery of one in fruit, circling round, and sailing with outspread and down-pointed wings till they alight on the tree." I have often wondered at the skill with which flocks of this Parrakeet glance and twist between the trunks of a tolerably thick palmyra-grove, flying with arrow-like speed, and do not strike against them; but it appears that sometimes they are not quick-sighted enough, for it is on record that they have flown against the walls of houses and been killed. The Shahin Falcon preys on this species, and some observers say that Owls kill them at night. Its note is shriller and shorter than that

of the large bird, and is much uttered in the mornings and evenings. It is noteworthy that caged specimens in England always become noisy, even in the long summer evenings, about 5 or 6 o'clock, the exact time of going to roost in their native country.

Layard writes the following account of a large colony of these Parrakeets at Chilaw:—"Hearing of the swarms which resorted to the spot, I posted myself on a bridge some half a mile away, and attempted to count the flocks that came from one direction, eastward, over the jungle. About five o'clock in the afternoon straggling bodies began to wing their way homeward, but many of them came back again to pick up the scattered grains left on the fields near the village; about half-past five, however, the tide fairly set in, and I soon found I had no flocks to count—it was one living screaming stream: some high in the air winged their way till over their homes, when, with a scream, they suddenly dived downwards with many evolutions until on a level with the trees; others flew along the ground rapidly and noiselessly, now darting under the pendent boughs of some mango or solitary tree, now skimming over the bridge close to my face with the rapidity of thought, their brilliant green plumage shining in the setting sunlight with a lovely lustre.

"I waited at this spot till the evening closed in, and then took my gun and went to the cocoanut-tope which covered the bazaar. I could hear, though from the darkness I could not distinguish, the birds fighting for their perches; and on firing a shot they rose with a noise like the rushing of a mighty wind, but soon settled again, and such a din commenced as I shall never forget."

This is the most commonly domesticated of the Ceylonese Parrakeets, and is a great favourite with Europeans and natives; it learns to talk well, and is very often brought home to England as a pet.

Nidification.—This species breeds in holes in trees, often at a considerable height from the ground, and lays four or five white eggs on the dead wood at the bottom of the cavity. The mouth of the hole is, Mr. Hume remarks, very neatly cut, circular, and about 2 inches in diameter. The nesting-time is in March and April; and the hen bird is given to sitting very close, for Captain Butler writes that he had to push one off her nest with his hand, and even then she would not leave the hole, although there were no less than three entrances by which she might have escaped. The eggs, which are of course white, are devoid of gloss, and are broad ovals in shape; they measure as the average size, according to Mr. Hume, 1·2 by 0·95 inch.

PALÆORNIS CYANOCEPHALUS.

(THE BLOSSOM-HEADED PARRAKEET.)

Psittacus cyanocephalus, Linn. Syst. Nat. p. 141 (1766).

Psittaca bengalensis, Brisson, Orn. iv. p. 348 (1760); Gm. Syst. Nat. i. p. 325 (1786).

Psittacus indicus, Lath. Ind. Orn. i. p. 86 (1790).

Palæornis cyanocephalus, Blyth, Cat. B. Mus. A. S. B. p. 5 (1849); Kelaart, Prodromus, Cat. p. 127 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 264; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 616 (1856).

Palæornis rosa, Jerdon, B. of Ind. i. p. 259, et Ibis, 1872, p. 6; Holdsworth, P. Z. S. 1872, p. 425; Legge, Ibis, 1874, p. 14; Gould, B. of Asia, pt. xxvi. (1874); Legge, Ibis, 1875, p. 282.

Palæornis bengalensis, Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. p. 208.

Palæornis purpureus, Hume, Nests and Eggs (Rough Draft), p. 116 (1873); Hume, Str. Feath. 1873, p. 433; Ball, Str. Feath. 1874, p. 390; Brooks, ibid. 1875, p. 232; Butler, ibid. p. 457.

La Perruche à tête bleue, Brisson, Orn. iv. p. 359, pl. 19. fig. 2; *Blossom-headed Parrakeet*, Latham, and Gould, Birds of Asia; *Rose-headed Parrakeet, The Ashy-headed Parrakeet* (Kelaart).

Faraida, lit. "the plaintive or complainer," Beng.; *Tui-suga*, Nepalese; *Tiua-tota*, Hind. in the south; *Bengali-tota*, in the Punjaub; *Rama-chilluka*, Telegu.

Battoo girawa, Malitchia, Sinhalese; *Killi*, Ceylonese Tamils.

Adult male. Length to front of cere 12·0 to 13·6 inches; culmen 0·8; total length varying from 13·0 to 14·0; wing 5·1 to 5·25; tail 7·0; tarsus 0·5; outer anterior toe and claw 1·0; depth of upper mandible at cere 0·37.

Iris white, pale yellowish white, or greenish white, with a dusky or greyish inner circle, which latter is divided sometimes from the pupil by a whitish ring; cere olivaceous green; eyelid olive-brown; bill, upper mandible orange-yellow, variable in depth of hue, and in some with a dusky tip, lower mandible black or blackish brown*; legs and feet dusky sap-green, claws plumbeous with dusky tips.

Head, face, and nape covered by a cap of flame- or rose-red, which is bounded beneath by a narrow black collar and overlaid gradually from the crown and cheeks downwards with delicate blue; the black collar is concealed by the overlying cap on the hind neck and widens below the cheeks, passing up by the base of the bill to the gape; below this collar the neck is encircled with verdigris-green, varying in extent, and passing into the yellowish green of the back and scapulars; wings, rump, and upper tail-coverts verditer-green, brightest on the latter parts; quills brown internally and with a fine yellow outer margin; a dark red spot on the median wing-coverts; middle pair of tail-feathers blue, washed with green at the base, and with deep white tips, the rest green with the tips yellowish and bases of inner webs rich yellow; beneath yellowish green, more verdant on the lower parts and under tail-coverts; axillaries and under wing-coverts pale emerald-green.

Individuals vary in the hue of the rump and the depth of the white tail extremities; and many that have attained the adult cap, but have not arrived at the full age of maturity†, have a greenish-yellow semi-collar below the green ring, and a more yellowish hue on the back, tertials, and under surface.

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* Like other Parrakeets this species usually has the bill so discoloured that it is difficult to tell what its colour really is.

† This is difficult to define, for, as Capt. Hutton remarks from observation of caged birds (Str. Feath. vol. i. p. 344), each subsequent year after the third "only adds to the richness of colouring."

Female. Less than the male; wing 4·9 to 5·1 inches. Upper mandible yellow; lower dusky or blackish. The cap is dull plum-blue, wanting the black collar and mandibular stripe, and bounded by a yellow ring clearly defined on the sides of the neck; back brownish green; wings wanting the red shoulder-spot; chest washed with yellowish.

Young. The nestling is clothed with green feathers; the bill is at first black, changing in the male, at about a fortnight old, into yellow.

The bird of the year has the bill greenish yellow, dusky along the culmen; iris white, tinged with green; legs and feet plumbeous green.

Plumage green throughout, brightest on the rump and lower back, paling slightly on the forehead, and with the hue of the hind neck rather light, contrasting somewhat with the dark green of the nape; the central tail-feathers are rather short and washed with blue, the tips being whitish.

In the next stage the forehead becomes paler and the head bluish, with a dusky edge bordering the lower mandible: the central rectrices are blue, as in the adult, but with less of the white colour at the extremities.

Lutinos of this Parrakeet are occasionally met with. A beautiful example, in perfect luteous plumage, was given to His Royal Highness the Duke of Edinburgh by the Mudliyar Jayetilke of Kurunegala.

Obs. Ceylonese examples of this Parrakeet are, as a rule, smaller than Indian, among which northern birds seem to be the largest. The wings of five males from India are as follows—Madras, 5·3 inches; Bengal, 5·4; Bengal, 5·5; Nepal, 5·7; Nepal, 5·3: those of two females—Bengal, 5·2; "India," 5·4. The coloration of the rose and blue cap corresponds with that in the insular bird.

The Burmese bird, the *Pal. rosa* of Boddaert, founded on plate 888, Pl. Enl., which was long confounded with this species, has the head less covered with the azure hue, the axillaries and wing-lining *blue*, and the female has the red wing-spot as well as the male. Mr. Blyth, who published a remark on the subject in the 'Ibis,' 1870, appears to have brought the fact of these differences to the notice of Mr. Gould. Both species are beautifully figured in Mr. Gould's great work on the 'Birds of Asia;' but unfortunately in the letterpress the specific names have, I conclude, by a *lapsus calami* become inverted; the Indian bird is called *rosa* and the Burmese *cyanocephalus*. He remarks, in the commencement of his article on the Indian bird headed *Pal. rosa*, that it should bear the name of *P. cyanocephalus*, founded on the "Perruche à tête bleue," Brisson, Orn. iv. p. 359, pl. 19. fig. 2; so that the mistake is apparent at a glance. The Burmese bird *Pal. rosa* is, I observe, styled *Pal. bengalensis* by writers in 'Stray Feathers,' this name being in reality a synonym of *Pal. cyanocephalus*.

Distribution.—This beautiful Parrakeet is abundant in many parts of the low country, and tolerably plentiful in the coffee-districts up to an elevation of about 4000 feet. It is not, as a rule, found very near the sea-coast. In the Galle district it is first met with about 15 miles inland, and is common from there up to the Morowak Korale, wherein the country and vegetation suit its habits. In the interior of the Western Province, from Aviswella to Ratnapura and through the Saffragam valley to the district lying to the south of Haputale, as also in the Pasdun and Raygam Korales, it is a common bird. I have seen it about 10 miles inland from Kalatura. Mr. Parker writes me that it is not found nearer Puttalam than Uswewa, and northward of this it keeps to about the same distance from the sea; further inland about Kurunegala and in most parts of the Seven Korales, as well as along the base of the hills to Dambulla, it is tolerably plentiful. Beyond Anaradjapura it becomes scarcer, being only found in certain suitable localities. In the Jaffna peninsula I have not seen nor heard of it. It appears not to be found near Trincomalie, but to the south of the Virgel I once met with it, and that, too, at no great distance from the sea. It is not uncommon in the Eastern Province and about Nilgalla. In the Magam Pattu it frequents the cheenas of the natives. As regards the Central Province, it is common in the Knuckles, Pusselawa, Deltota, Maturata, and other districts round Kandy. In the vicinity of Badulla and in Madulsima it is likewise tolerably plentiful.

On the continent Jerdon says that "it is found more or less throughout India, extending into the Himalayas." It is common on the Malabar coast and in the jungles of the Carnatic and in the Eastern Ghâts. Mr. Bourdillon does not seem to have met with it in the Travancore hill-region, but Mr. Fairbank says that it is common on the Palani hillsides up to 4000 feet; the same writer remarks that it is common along the hills in Khandala, and visits the Deccan at some seasons in flocks. Mr. Ball says that it is found in most parts of Chota Nagpur, but at the same time it is somewhat local; it is likewise common about the Sambhur

Lake; and throughout the entire north-western region of Mount Aboo and Guzerat it is found, not frequenting, however, the parched-up province of Sindh, which is only to be expected, seeing that it is a bird which loves a luxuriant country. It inhabits the plains at the foot of the great Himalayan range, extending into those mountains up to 5000 feet, but giving place as it goes eastwards to the Burmese bird, *P. rosa,* which ranges as far westward as Nepal.

Habits.—In the Central Province this Parrakeet frequents chiefly the patnas on the hillsides and the vicinity of the paddy-fields of the natives in the valleys. In the low country it is partial to wooded lands near rice-fields, open glades, cheenas, and clearings generally in the jungle. It forms one of the most pleasing ornithological features of Ceylon, what with its gay plumage and its restless disposition, leading it to dash about in small parties, which glance with the swiftness of an arrow down the valleys and ravines of the verdant forests, and make these lovely spots re-echo with its musical whistle, while its bright green attire contrasts with the many-coloured foliage of the woods. It perches much on the very tops of trees, balancing itself on the smallest leafy twig, and remains perfectly motionless until started into flight by the approach of danger. Mr. Ball remarks that the way in which these birds conceal themselves in trees is a matter of surprise, and hints that it is apparently not only the colour but the position in which they perch that accounts for their similarity to the surrounding foliage. In hot weather in Chota Nagpur they choose the Sal tree (*Shorea robusta*), and one may approach within a few feet of the birds without being able to distinguish a single individual. I have myself observed the same thing with *Palæornis torquatus,* when perching or feeding in a tree with small light-green roundish leaves, the name of which I am not acquainted with.

The present species is very fond of dead trees, which usually stand in cheenas in the low-country jungles; it climbs actively about the branches of these, using its bill, and shows its plumage off to advantage against the charred wood. Its flight is very swift indeed, and when shooting down a ravine it proceeds with an oscillating or side to side motion, its wings half-closed, at a speed surpassed by few birds in Ceylon. Its note is a clear and high-pitched musical whistle, which is usually uttered on the wing; it is possessed of considerable vocal powers, and can be taught, in confinement, to whistle tunes, Captain Hutton recording an instance of one which whistled many familiar airs. It is not, however, kept as a caged bird in Ceylon to such an extent as either of the foregoing species.

It is most destructive to the grain fields of the natives, devouring enormous quantities of Kurrukan, which is in many wild parts of the forests the only edible seed they cultivate; it also attacks the brinjals and small red cucumbers which are much grown on newly burnt cheenas. Large flocks take up their quarters in these localities and resist all attempts to drive them away, returning immediately after being shot at, and settling on the tops of their favourite dead trees until they can again with safety renew their pillaging on the vegetables of the unfortunate half-starved cultivators.

Nidification.—This Parrakeet breeds from February until May in the western parts of Ceylon, nesting in holes in the smaller limbs of dead trees. I once found its nest in a mere sappling but a few inches in diameter; at the bottom of the cavity were a number of dry pellets of earth, which made it apparently rather uncomfortable for the 4 young ones which were huddled together in it. They bore their own nest, choosing a partially decayed piece of wood, which they follow up into the centre of the branch, making the egg-cavity larger than the entrance. The eggs are laid on the dead wood, and the female is a very close sitter. The eggs are usually four in number and are pure white, the shell being devoid of gloss; they average 1·0 by 0·81 inch.

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Hanhart imp.

PALÆORNIS [illegible]ALTHE[illegible]Æ
[illegible]

PALÆORNIS CALTHROPÆ.

(LAYARD'S PARRAKEET.)

(Peculiar to Ceylon.)

Palæornis calthropæ (Layard), Blyth, J. A. S. B. 1849, xviii. p. 800; id. Cat. B. Mus. A. S. B. p. 340 (1849); Kelaart, Prodromus, Cat. p. 127 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 263; Bonap. Rev. et Mag. de Zool. 1854, p. 263; Gray, List Psittacidæ Brit. Mus. p. 22 (1859); Schlegel, Mus. P.-B. *Psittaci*, p. 83 (1862); Finsch, Papageien, p. 53 (1868); Holdsworth, P. Z. S. 1872, p. 426; Layard, P. Z. S. 1873, p. 204*; Legge, Ibis, 1874, p. 14; Hume, Str. Feath. 1874, p. 18; Gould, B. of Asia, pt. xxvi. (1874); Legge, Str. Feath. 1875, p. 200; Walden, Ibis, 1874, p. 288.

Palæornis cathrapæ, Blyth, Ibis, 1867, p. 294.

Palæornis gironieri, J. & E. Verr. Rev. et Mag. de Zool. 1853, p. 195.

Psittacus viridicollis, Cassin, Pr. Philad. Acad. 1859, p. 373.

Layard's Purple-headed Parrakeet (Kelaart); *The Ceylon Parrakeet, The Hill-Parrot*, Europeans in Ceylon.

Alloo-girawa, Sinhalese, Central Province.

♂ *ad.* suprà grisescens flavido adumbratus, capite puriùs pallidè purpurascenti-griseo, fronte, loris, regione paroticâ et facie anticâ viridibus: regione paroticâ posticâ pileo concolori, genis posticis nigris ad fasciam brevem cervicalem nigram productis: collo postico lætè smaragdineo fasciam collarem conspicuam formante: alâ saturatè viridi. remigibus intùs nigris, tectricibus alarum interioribus flavicanti-viridibus: dorso postico, uropygio et supracaudalibus pallidè purpureis, his vix flavido lavatis: caudâ sordidè purpureâ, rectricibus flavo terminatis, exterioribus quoque intùs sordidè viridibus, extùs purpureis: corpore subtùs lætè viridi, gutture imo et præpectore smaragdineo lavatis: subcaudalibus et caudâ subtùs flavis, illis viridi lavatis: subalaribus smaragdineis, majoribus et remigibus infrà cinerascentibus: maxillâ scarlatinâ, mandibulâ saturatè rubrâ, apicaliter flavâ: pedibus fuscescenti-viridibus: iride flavicanti-albâ.

♀ *ad.* mari similis, sed mandibulâ nigrâ distinguenda.

Adult male and female. Length to front of cere 10·6 to 11·0 inches; culmen 1·05; total length of the larger about 12·1; wing 5·4 to 5·6; tail 5·8; tarsus 0·6; outer anterior toe and claw 0·98 to 1·0; greatest height of upper mandible 0·47.

Male. Iris yellow-white, or white, or greenish white, with a bluish-grey outer circle; cere dusky greenish; bill, upper mandible coral-red, yellowish at tip, lower dusky red; legs and feet dusky greenish, plumbeous green, or plumbeous.

Head, nape, and cheeks faded leaden blue, changing into green on the region round the eye and at the base of the upper mandible, and blending into a broad black border below the cheeks, which extends across the throat (more so in some specimens than in others); across the hind neck a broad emerald-green collar, blending into the green of the chest and under surface; the hind neck below the collar, interscapulars, and scapulars greenish grey, with a bluish cast, changing into pale greyish blue on the back, rump, and upper tail-coverts, the latter part tinged with green on the longer feathers.

Wings green, the median secondary coverts pale at the extremities; lesser coverts just above the forearm bluish; 1st primary and inner webs of all the quills brown; tail French blue, tipped deeply with yellow, the inner webs of all the lateral feathers washed, and the outer webs finely edged with green; the tail beneath yellowish; under tail-coverts yellowish, tipped and edged green; under wing-coverts green.

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* I am informed that the correct orthography of this Parrakeet's specific name should be *calthorpæ*, as the family name was Calthorp, and not Calthrop. However, Layard says here, "I have to thank Mr. Holdsworth for restoring the true reading of this name." I therefore leave the matter as it is.

The colours of this Parrakeet appear to be much affected by the sun's rays; the head and back lose their brightness, and become pervaded with a greyish hue, altering much the delicate character of the plumage. Specimens likewise fade after preservation.

Female. Bill, upper mandible black, lower blackish, tinged with reddish. The green on the lores and orbital region less in extent, and the centre of the back (as far as I have observed) more brilliant than in the male. As the coloration of the female's bill has been the subject of some controversy, I may remark that Mr. Holdsworth first pointed out that it was black. Adults of both sexes have sometimes, when in rich plumage, a slight cobalt-hue wash on the forehead and cheeks.

Young. Iris whitish; bill (male) pale orange, (female) upper mandible dusky black, lower reddish; feet and legs plumbeous.

Birds of the year are dull green above and yellowish green beneath; the head darker than the back and sometimes with a bluish tinge; there is an indication of the green collar on the hind neck; the back and rump cobalt-blue (brighter than the adult); tail green, washed with blue, tipped and edged internally with yellow towards the extremities, lower feathers of the upper tail-coverts green; some individuals have the tail bluer than others.

Obs. This species comes nearer the South-Indian Parrakeet (*Pal. columboides*) than any other, but has not even much in common with that. There is, however, a slight general resemblance in the two birds, which is in accordance with the relationship displayed between the avifaunas of the regions in question. *Pal. columboides* has the wing 5·7 to 6·0, and is therefore a larger bird, with a correspondingly longer tail. The black ring in this species completely encircles the neck, the under surface is slaty instead of green, the rump is green instead of blue, and the primaries and their coverts obscure blue.

Distribution.—The Ceylon Parrakeet was discovered by Layard, who writes thus concerning it in the 'Annals and Magazine of Natural History' for 1854:—"My first acquaintance with this lovely bird was at Kandy, where I killed a male and female at one shot from a flock flying over my head; I took them for the common *P. torquatus* until I picked them up, and then great was my delight to find such an elegant new species. It proves to be the common Parrakeet of the hilly zone, and I have traced it to all parts of it." As Layard remarks, this species is distributed throughout the hills of the Kandyan Province; but it is singularly local as regards some parts, small districts here and there appearing to be surrendered almost entirely to the last species. Of such I may mention portions of the Pusselawa, Hewahette, and Kalebokka valleys, as well as parts of Dumbara, where, in the month of November, I have met with numbers of *P. cyanocephalus*, to the almost entire exclusion of the present Parrakeet. It is numerous about Kandy and Peradeniya, and also Deltota, in Upper Hewahette, Poondoloya, most parts of Uva, Madulsima, and Haputale, while it is still more abundant in Maskeliya, Dickoya, and throughout the Peak forests at intermediate altitudes. In the south it is numerous in the Morowak Korale, and very abundant indeed in the higher parts of the Kukkul Korale, notably in the Singha-Rajah forest, concerning which region I wrote, in my paper "On the Distribution of Birds in the Southern Hill-region of Ceylon" ('Ibis,' 1874), that I considered it more abundant there than in any other part of the island, a conclusion to which I still adhere.

It was thought for many years to be an inhabitant only of the hills, an idea which obtained on account of the very imperfect exploration of the forests round the base of the central zone, and the repeated working of naturalists over certain beaten tracks. In 1870 I first met with it in the low country, down in the valleys adjacent to the Hinedun Kanda or Haycock Hill, and was somewhat surprised at finding it there, while I had not seen nor heard it in the Oodogamma or Opaté forests, a district lying higher than the one in question. My next meeting with it was in the park-like woods lying between "Westminster Abbey" and Kollunpitiya, on the new Batticaloa road, and which are studded with those remarkable rocky hills so characteristic of the Eastern Province. I subsequently found it about Nalanda, and all round the base of the Matale Hills, from Dambulla to Kurunegala: beneath the Ambokka range it is abundant. The greatest extent of low country, however, over which it is spread lies in the Western Province, between Ruanwella and Pelmadulla. I found it close to Ukawatta, about 26 miles from Colombo, where it was frequenting the tall timber-forests; it was also very common in the Kuruwite forests, and thence up to Gillymally, as well as in other parts of the valley of

Saffragam. Beyond the Karawita hills, which lie to the south of the Kaluganga, I again met with it in the forests of the northern or lower part of the Kukkul Korale, and traced it into the Pasdun Korale as far as the remote and sequestered village of Moropitiya. Nearer the sea than this locality I did not find it. In the south its coast-wise limit appears to be the vicinity of the Haycock, and in the east that of "Westminster-Abbey" hill.

From the above remarks it will be seen that this Parrakeet spreads into the low country at all points connected with an adjacent forest-covered range, in which it is numerous.

As regards the altitude to which it ascends, I have seen it between 5000 and 6000 feet above Maturata, at a similar height in the Wilderness of the Peak and in Haputale, and Dr. Kelaart records it from Nuwara Elliya, though neither Mr. Holdsworth nor Mr. Bligh met with it there.

Habits.—Layard's Parrakeet frequents the outskirts and open places in the interior of forests, patna-woods, wooded gorges, and glades in the vicinity of hills; it associates in moderately-sized flocks, and is a very noisy and restless bird, uttering its harsh "crake" on the wing, as it dashes up and down the magnificent valleys and forest-clad glens of the Ceylon mountains, and enlivens these romantic solitudes with its swift and headlong flight. It is entirely arboreal in its habits, settling in flocks among the leaves of its favourite trees, and silently devouring the fruit-seeds and buds on which it subsists. It is very partial to the wild fig, the fruit of the Kanda-tree (*Macaranga tomentosa*), the wild cinnamon-tree, and the flowers of the Bomba-tree. After feeding in the mornings it becomes garrulous, assembling in small parties in shady trees, and keeping up a chattering note almost similar to that of *Layarda rufescens*; towards evening it commences to feed again, and before going to roost roams about in small flocks, constantly uttering its loud harsh note, and settling frequently on the tops of conspicuous and lofty trees. In the Singha-Rajah forest their presence at evening was more conspicuous than that of any other bird; they darted up and down the deep gorges and across the small Kurrakan clearings in the forest, keeping up an incessant din; now and then they rested on the top of some dead tree standing in the cheena, and then suddenly glanced off, shooting with arrow-like speed between the trees of the forest, again to appear as they swept up the valley and away over the top of the gloomy jungle.

Its flight is bold and swift, but not of that glancing character peculiar to the last species; and this, together with its harsh cry, which can be heard a long way off, seems to distinguish it easily from *Pal. cyanocephalus*.

Nidification.—The breeding-season commences in January. It nests in holes in large trees; but I have never been able to procure the eggs, although I have more than once discovered the nest. I have seen one situated in a Hora-tree (*Dipterocarpus zeylanicus*); the old birds, on flying to it, clung to the bark outside the opening, and then pulled themselves into the hole, using the beak to assist them in entering. Layard writes that he was informed by natives that they laid two eggs, which, like those of other members of the family, would be pure white. In the Peak Wilderness they breed in the decaying trunks of dead Kitool-trees.

The figures on the Plate are those of an adult female in the foreground, with a slightly abnormal amount of black below the cheeks, and a young male from Kaloday, Eastern Province, in the background, which should have been drawn with the back turned to the front, so as to show the peculiarly light blue on the rump of immature males. Unfortunately, however, the requirements of the author and the tastes of the artist are sometimes at variance. I had wished that these birds should be figured on the "Jambu-tree," a sketch of which, by Sir Chas. Layard, I furnished my artist with; but it was not found suitable, and he has introduced the common fig-tree of Europe instead.

PSITTACI.

Fam. TRICHOGLOSSIDÆ.

Bill with the upper mandible long, compressed gradually from the base, the tip rather straightened and acute; under mandible *longer than it is high*, the tip less obtuse than in the *Psittacidæ*.

Genus LORICULUS.

Bill with the upper mandible long, gently curved, compressed; margin with a slight lobe near the base; cere rather advanced; under mandible shallow and considerably elongated. Wings long, with the 2nd quill the longest, and slightly exceeding the 1st and 3rd. Tail short, rounded, scarcely exceeding the closed wings. Tarsus very short. Toes long, the outer anterior much exceeding the inner, which is about equal to the tarsus; claws stout, long, and well curved.

LORICULUS INDICUS.

(THE CEYLONESE LORIKEET.)

(Peculiar to Ceylon.)

Psittacus indicus, Gm. Syst. Nat. i. p. 349 (1788).
Psittacus asiaticus, Lath. Ind. Orn. i. p. 130 (1790).
Psittacula indica, Briss. Orn. iv. p. 390 (1760).
Psittacula coulaci, Lesson, Tr. d'Orn. p. 202 (1831).
Loriculus asiaticus, Blyth, J. A. S. B. 1849, xviii. p. 801; Kelaart, Prodromus, Cat. p. 127 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 261; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 628 (1856).
Loriculus indicus, Bonap. Rev. et Mag. de Zool. p. 155 (1842); G. R. Gray, List Psitt. Brit. Mus. p. 55 (1859); Schlegel, Mus. P.-B. *Psittaci*, p. 132 (1864); Walden, Ibis, 1867, p. 467; Holdsworth, P. Z. S. 1872, p. 426; Legge, Ibis, 1874, p. 15.
Loriculus edwardsi, Blyth, Ibis, 1867, p. 295; Nevill, J. A. S. (Ceylon Br.), 1870–1, p. 32.
Coryllis indica, Finsch, Papag. ii. p. 714 (1868).
The smallest Red-and-green Parrakeet, Edwards, Glean. pl. 6 (1743); *Red-and-green Indian Parrakeet*, Lath. Synopsis (1781), also *Red-rumped Parrakeet*, Lath. Gen. Hist. (1822); *Das ceylonische Papageichen*, Finsch, Papag.; *The Small Ceylon Parrakeet*, Kelaart; *The Ceylon Love-bird* of travellers.
Gira-malitchia, *Pol-girawa*, lit. "Flower Parrakeet," Sinhalese.

Similis *L. vernali*, sed capite et occipite rubris, nuchâ flavo adumbratâ diversus. *Juv.* capite viridi dorso concolori distinguendus.

Adult male and female. Length to front of cere 5·1 to 5·2 inches; culmen 0·55; total length averaging 5·7 to 5·8; wing 3·6 to 3·8; tail 1·7; tarsus 0·4; outer ant. toe and claw 0·75.

Iris white; bill light orange-red, paler at the tip, lower mandible paler than the upper; legs and feet dusky yellow; cere yellow.

Lower hind neck, back, and wing-coverts leaf-green; forehead and front of crown rich deep red, gradually becoming overcast with an orange hue on the nape, and fading into the green of the hind neck; the upper part of the back is more or less pervaded with a dull golden cast; rump and upper tail-coverts deep red, outer webs of quills and the tail dark green; inner webs of primaries above dark hair-brown, 1st quill with a fine greenish-blue edging; beneath the inner webs of the quills and the lower surface of tail verditer-blue. Cheeks, region round the eye, and entire under surface pale green, washed with bluish across the fore neck.

Young. Iris dull grey or olive; bill dusky yellow; legs and feet olivaceous yellow, claws blackish. Head above green, with the forehead pale, and an aureous cast on the crown; rump and upper tail-coverts as in the adult; fore neck without the bluish tinge. Birds of the year are full-sized.

Lutinos of this species are not uncommonly met with. A description of a beautiful example is given by Mr. Nevill, of the Ceylon Civil Service (*loc. cit.*), as follows:—"Crown of the head and rump brilliant scarlet, shading into metallic orange on the rump; back vivid golden yellow, dappled with emerald-green, and tinged in places with orange; wings green, mottled with bright yellow; quills of the normal colour, tipped with yellowish white; beneath bright but paler yellow than the back, mottled with bright pale grass-green; throat yellowish; cheeks rufescent; under wing-coverts mottled green, yellow, and straw-colour."

Obs. Loriculus apicalis, from the Philippines, is very close to this Lorikeet: a specimen in the British Museum, from Mindanao, is scarcely separable in any other point but the coloration of the head, which is pale or yellowish red; the hind neck wants the aureous wash, and the throat has only a very faint wash of blue on it. *L. indicus* also resembles the Indian and Andaman species, *L. vernalis*, in most points, differing from it chiefly in the head. The latter bird has the head grass-green, concolorous with the back, with the forehead brighter than the crown, and the hind neck wanting the aureous colour of *L. indicus*; the red on the rump does not extend so high up the back; the coloration of the tail and wings is almost identical with that of the insular bird. The wing varies from 3·5 to 3·75 inches, or much the same as in *L. indicus.*

Distribution.—This pretty little bird, so well known as a caged pet to travellers who touch at Point de Galle, by whom it is generally styled the "Love-bird," is widely distributed throughout the low country of the island, and is commonly located in the hills up to an elevation of 3500 feet. In the south-west of the island it is extremely abundant, frequenting the cocoanut-groves close to the port of Galle, as well as the entire semi-cultivated interior of that district. Further up the west coast it is not common near the sea, but in the openly wooded and partly cultivated portions of the Western Province it is abundant; and in the Ratnapura and Kurunegalla districts is quite as numerous as about Galle. To the north of the Seven Korales it is less plentiful; but I have met with it here and there throughout all the forest-tracts of this part of the island, and in the N.E. monsoon have seen it in the woods near Fort Ostenburgh, Trincomalie. I have noticed it again in many parts of the Eastern Province, but I do not think it is as generally distributed there as in the west. Layard found it abundant about Hambantota, but I did not observe it at all in that district during two visits I made to it; in the north of the Magam Pattu I found it, but not on the scrubby sea-board near Hambantota. In the Central Province it is common about the patnas in Dumbara and Pusselawa and in many parts of Uva, and during the dry weather prevalent in the N.E. monsoon ascends above an altitude of 4000 feet. Mr. Thwaites, of Hakgala, informs me that he has seen it in the gardens at that season of the year.

This little bird is not very aptly styled *indicus*; but Gmelin, who named it from the figure in Edwards's plate, did not know from what exact locality he received his specimen, as all the information which Edwards could give about it was contained in the words, "brought from some Dutch settlement in the East Indies." When the bird became better known it was apparent that this settlement was Ceylon.

Habits.—The Ceylon Lorikeet frequents woods, detached groves of trees, compounds, native gardens, patnas dotted with timber, and, in fact, any locality which is clothed with fruit-bearing trees or those whose

flowers afford it its favourite saccharine food. It is a most gluttonous little bird, constantly on the wing in active search for its food, darting with a very swift flight through the woods, uttering its sibilant little scream, its bright plumage flashing in the rays of the tropical sun. When it reaches a tree which attracts its attention it instantly checks its headlong progress, and alighting on the top, actively climbs to the fruit which it has espied, or should the tree prove barren, after giving out its call-note for a short time, darts off, perhaps in the opposite direction from which it came. It is excessively fond of the "toddy" or juice which exists in the Kitool or sugar-palm (*Caryota urens*), and feeds on it to such an extent that it becomes stupified and falls an easy captive to the natives, who cage it in large numbers for sale at Point de Galle.

While in a state of captivity they are fed on sugar-cane, of which they are very fond, but they do not live for any length of time should the supply of cane come to an end. It feeds so gluttonously on the beautiful fruit of the Jambu-tree that I have seen bird after bird shot out of one tree without their companions taking the slightest notice of the gun or the death of so many of their little flock*. When held up by the legs, after being shot, the juice of this fruit pours from their mouths and nostrils. The flowers of the cocoanut-tree come in for a large share of its patronage, as do also those of other trees, on the "cups" or calyces of which it subsists, biting them off in a pendent attitude. Layard writes that "at Gillymally they were in such abundance that the flowering trees were literally alive with them; they clung to the bright scarlet flowers head downwards, or scrambled from branch to branch, while the forest echoed with their bickerings. They bit off the leaves (which fell like scarlet snow upon the ground) to get at the calyx; and when this dainty morsel was devoured they flew off to the banana-trees, down the broad leaves of which they slid and fastened upon the ripening clusters of fruit or the pendent heart-shaped flower."

When roosting at night they sleep hanging by their feet from the perch.

The figure in the Plate facing my article on *Palæornis calthropæ* is that of an adult bird, and that on the Plate of *Xantholæma rubricapilla* an immature or yearling individual.

* I have observed the same of *Trichoglossus pusillus* in Australia, which it is sometimes impossible to drive from a tree laden with ripe cherries otherwise than by vigorously shaking the stems!

Order PICARIÆ.

Distinguished from the *Passeres* by the presence of a double notch in the posterior margin of the sternum. Bill not toothed. Wing with ten primaries. Feet in the Scansorial section arranged in pairs, two in front and two behind; in others simple, and arranged three in front and one behind.

Fam. PICIDÆ.

Bill straight, pointed or wedge-shaped at the tip. Head generally crested. Tail of twelve feathers, with the shafts rigid and stout. Feet zygodactyle, one of the posterior toes sometimes wanting.

Skull very strong. Tongue very long and extensile, and furnished at the tip with barbs. Sternum with a double notch in the posterior edge.

Subfam. PICINÆ.

Bill moderate or long, compressed, with the tip wedge-shaped, the ridge acute, and the lateral ridge just above the nostrils and *very* pronounced; the gonys long. Feet large; the outer posterior toe longer than the outer anterior one; the inner posterior toe always well developed.

Genus PICUS.

Bill of medium size, culmen nearly straight and sharp, lateral ridge parallel to the culmen and continued forward till it meets the margin. Nostrils concealed by a tuft of feathers. Wings with the 1st quill very short, the 2nd considerably shorter than the third, and the 4th and 5th the largest. Tail with the shafts stiff and decurved, the tip forked. Tarsus longer than the anterior toe, which is shorter than the versatile or long posterior toe; claws strong and curved.

PICUS MAHRATTENSIS.

(THE YELLOW-FRONTED WOODPECKER.)

Picus mahrattensis, Latham, Ind. Orn. Suppl. ii. p. 31, female (1790); Sykes, P. Z. S. 1832, p. 97; J. E. Gray, Ill. Ind. Zool. pl. 32 (1830–2); Gould, Cent. Him. Birds, pl. 51 (1832); Blyth, J. A. S. B. 1845, p. 196; id. Cat. B. Mus. A. S. B. p. 62 (1849); Layard et Kelaart, Prodromus, Cat. Append. p. 59 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 448; Horsfield & Moore, Cat. B. Mus. E. I. Co. ii. p. 674 (1856); Malh. Mon. Picidæ, i. p. 108, pl. 28. figs. 1–3 (1863); Jerdon, B. of Ind. i. p. 275 (1862); Holdsworth, P. Z. S. 1872, p. 426; Hume, Nests and Eggs, p. 122 (1873); Legge, Ibis, 1875, p. 283; Ball, Str. Feath. 1874, p. 390; Hume, ibid. 1875, p. 58.

Picus hemasomus, Wagler, Syst. Avium, gen. *Picus* (female), no. 30 (1827).

Picus aurocristatus, Tickell, J. A. S. B. 1833, p. 579.

Dendrocopus mahrattensis, Jerdon, Cat. B. S. India, Madr. Journ. 1840, p. 212.

Liopipo mahrattensis, Cab. et Heine, Mus. Hein. v. p. 44 (1862).

The Mahratta Woodpecker, *The Black-spotted Woodpecker* of Europeans.

Kāralla, Sinhalese; *Tatchan-kuruvi*, Tam., lit. "Carpenter-bird."

Adult male and female. Length 6·8 to 7·0 inches; wing 3·7 to 3·95; tail 2·5; tarsus 0·7; outer ant. toe 0·55, claw (straight) 0·33; hind toe 0·6; bill to gape 1·05. Females are usually smaller than males.

Iris variable, red or dull red; bill dusky bluish, culmen and tips dusky; legs and feet plumbeous, claws darker than toes.

Male. Forehead, front of crown, lores, and region round eye pale shining yellowish or straw-colour, extending further back in some specimens than in others, and changing on the crown and occiput into pale crimson. Chin, face, and a continued stripe from the ear-coverts down the sides of the hind neck, throat, centre of the chest, and breast white, the ear-coverts slightly dusky in some; sides of neck and chest, down the centre of hind neck, hair-brown, darkening on the upper part of the back into the brownish black of the upper surface, wings, and tail; feathers of the back with white basal and lateral stripes; the wing-coverts, quills, and tail with large marginal white spots, taking the form of bars on the inner webs of quills; the 1st (small) quill with the outer web unspotted; sides of the breast, flanks, and under tail-coverts white, with very wide dark centre-stripes; centre of the breast and belly pale crimson; tail-spots yellowish beneath. The brown of the neck and chest is very pale in some specimens, probably the effect of the sun's rays, as the brown hue in most Woodpeckers is affected by them.

Female. Has the yellow of the forehead continued over the top of the head to the occiput, which wants the crimson hue: ear-coverts duskier than in male; sides of the chest and flanks somewhat more covered with brown than in the male.

Obs. Ceylonese examples seem to be smaller than Indian. An individual in the national collection, from the N.W. Provinces, has the wing considerably above 4 inches. Mr. Ball gives an extensive table of measurements, *loc. cit.*, from specimens shot in Chota Nagpur, by which it appears that males there have the wing exceeding 4 inches and females from 3·9 to 4·0 inches. The character of the black and white markings is similar in specimens from India and Ceylon. The Burmese race has been separated by Blyth as *P. blanfordi*, with an expressed doubt, however, as to its being really separable. Mr. Hume does not consider it to be so, and writes, with reference to the alleged greater development of the white markings, that Indian specimens "vary much *inter se*. An example from Wynaad is very dark; one from Kutch, again, very similar to *blanfordi*, and one from Sambhur is undistinguishable from Thayetmyo birds; in the wings there seems to be no appreciable difference."

Distribution.—This little Woodpecker has a wide distribution in Ceylon, but is, notwithstanding, by no means plentiful, and is rarely met with except by those who explore the wilds of the woods and forests. Mr. Holdsworth says that it is common in the Aripu district. I have procured it in the Magam Pattu and seen it close to the sea at Kirinde; in the Wellaway Korale it is also to be found. In the southern and western portions of the island it is not found, as far as I am aware; and I have not seen it in the Trincomalie district, nor

in the interior of the country between there and the central road. Further north, however, it is found, for there the jungle is more suited to its habits. Mr. H. E. Hayes, of the Ceylon Public Works Dept., writes me that he has met with it at a place about 22 miles from Mullaittivu, called by the euphonious Tamil name of "Manawalempattumuripu!" Layard found it in the Northern Province and considered it to be confined to that part. I have seen it in the scrubs to the south of Kottiar, and all that densely clothed low jungle country lying between there and the Tamankadua Pattu is a most likely district for it. In the drier parts of the Central Province it is not unfrequent, inhabiting the secluded patna-nullahs, which are dotted here and there with clumps of wood interspersed with its favourite tree the *Euphorbia*. In such places I have seen it in the Hewahette district and also in Uva, in which latter part I once shot it on the Logole-oya, at an elevation of about 2500 feet.

In India the Mahratta Woodpecker is dispersed pretty well all over the peninsula, being found, according to Jerdon, in "almost every district up to the foot of the Himalayas, except in lower Bengal, though common in the Midnapore jungles." Particularizing the localities which it inhabits, we find it recorded by him as rare on the Malabar coast, but plentiful in the gap of Coimbatore. In the Palani hills it is not uncommon up to 5000 feet, a very considerable elevation for a heat-loving bird as it evidently is. It does not appear to be found in the Travancore hills, but Mr. Hume has received it from the Wynaad. In the Deccan and Khandala district it is widely dispersed, but not abundant. Further north, about the Sambhur Lake and in the Guzerat region, it is well known, though it appears, according to Mr. Hume, not to be found in Sindh. In Chota Nagpur it is distributed through the Province, though not very common. In Upper Pegu it again appears as the *P. blanfordi* of Blyth, and is, according to Captain Feilden, "found everywhere from the low grounds of Thayetmyo to the tops of the highest hills." Mr. Oates says it is common near the banks of the Irrawaddy, but was not observed by him far inland, showing that in Burmah as well as in other parts it is local.

Habits.—This species frequents low jungle and scrub, particularly that in which the *Euphorbia* grows; it is very partial to this tree; in fact every example I have met with in Ceylon was either actually on or in the vicinity of one. On the patnas I have usually observed it among scattered trees searching the trunks and branches with great agility, keeping chiefly to the underside of the latter, and working them out nearly to their extremities. It is a shy bird and difficult to procure, taking itself off with a short flight to an adjacent tree as soon as it perceives any one approaching it. It is usually a solitary bird, shunning the company of its species except in the breeding-season. It has a weak trill, not unlike that of the Pigmy Woodpecker, but of course louder; and Jerdon remarks that it also has a squeaking note. Layard observed it chiefly about *Euphorbia* trees, and Mr. Holdsworth noticed it on old fences as well as dead wood.

In India it keeps to particular trees—*Babool* in the Mount Aboo and Sambhur districts, and the Pulas-tree (*Butea frondosa*) in Chota Nagpur. Captain Feilden has observed it descending a tree tail foremost with great ease. Its food, according to my observations, consists mainly of small insects and ants; but Mr. Oates found small beetles in the stomach of one.

Nidification.—The nest of the Yellow-fronted Woodpecker has never, to my knowledge, been found in Ceylon. It is almost sure, however, to nest in the *Euphorbia* tree. In India it breeds from March until April, nesting in a hole in a partially decayed branch, choosing, when it can, a Babool tree. Mr. Hume records the finding of a nest at Etawah, the hole being cut on the underside of a Babool branch about 1·5 inch in diameter, and leading to the excavated egg-cavity about 15 inches below it; the eggs were laid on chips of the wood made in excavating the hole. The eggs are three in number, less spherical than, but in size resembling, those of "the Lesser Spotted Woodpecker of Europe." Before being blown they are a delicate pink, turning glossy white after being emptied of their contents. They measure 0·87 by 0·68 inch, this being, according to Mr. Hume, the average of a large series.*

* I have not included *Picus macei* in this work. It was mentioned by Kelaart as having been procured in the island; but it is more than probable the bird was not correctly indentified. It is a North-Indian species, and could not well have occurred in Ceylon, as Woodpeckers are not birds which stray from their usual habitat.

Of small size.

Bill much as in *Picus*, short, widened at the base and conic; gonys quickly ascending. Wings longer than in *Picus*, the secondaries long in proportion to the primaries; tail much as in that genus, the outer feathers not so rigid; tarsi and feet the same, with the versatile toe longer than the anterior.

YUNGIPICUS GYMNOPHTHALMOS.

(THE PIGMY WOODPECKER.)

Picus gymnopthalmos, Bl. J. A. S. B. 1849, xviii. p. 804; id. Cat. Mus. A. S. B. p. 64 (1849).
Yungipicus gymnopthalmus, Bonap. Consp. Vol. Zygod. p. 8 (1854).
Picus otarius, Malh. Mon. Picidæ, i. p. 152, pl. 35 (1863).
Yungipicus gymnopthalmos, Kelaart, Prodromus, Cat. p. 128 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 448.
Yungipicus gymnophthalmos, Jerdon, B. of Ind. i. p. 279 (1862); Holdsworth, P. Z. S. 1872, p. 427; Jerdon, Ibis, 1872, p. 8; Hume, Str. Feath. 1873, p. 433; Legge, Ibis, 1874, p. 15; id. Str. Feath. 1875, p. 365; Bourdillon, ibid. 1876, p. 389.
Baeopipo gymnophthalma, Cab. et Heine, Mus. Hein. v. p. 59 (1863).
Little Black-and-white Woodpecker, Europeans in Ceylon.
Mal-kūralla, Sinhalese.

Adult male and female. Length 4·7 to 4·9 inches; wing 2·8 to 3·0; tail 1·3; outer anterior toe 0·4 to 0·45, claw (straight) 0·25; bill to gape 0·6 to 0·7.

Iris white, greyish white, yellowish white, or reddish white (varies much): bill brownish olivaceous, somewhat paler beneath; eyelid and orbitar skin dull mauve or purplish; legs and feet greenish plumbeous.

Head above, centre of nape, and hind neck, back, wings, and tail very dark sepia-brown; back broadly barred, and the wing-coverts, quills, and tail spotted with white; on the rump and upper tail-coverts the white predominates, reducing the brown to bars; 1st quill and outer web of second unspotted brown; a broad white stripe passes from behind the eye to the nape; below this the cheeks, ear-coverts, and sides of neck are brown as the back; a narrow line of vermilion-red above the white stripe and partially concealed by the brown of the head; throat and entire under surface murky white; under tail-coverts striped and centered with brown; under wing-coverts white, barred with brown.

Female. Wants the vermilion superciliary stripe; otherwise as the male.

In some specimens the flanks and sides of lower part of breast show obscure brownish striæ.

Obs. Mr. Hume remarks of this species that "Ceylon specimens are absolutely identical with those from the Malabar coast." A female shot by Mr. Bourdillon in the Travancore hills measured—length 4·87 inches; wing 2·87; tail 1·25. This Woodpecker is very closely allied to the commoner Southern Indian race *Y. hardwicki*, which is, according to Jerdon, "brownish or sooty brown above, banded with white on the back; head pale rufescent or yellowish brown, scarcely deepening posteriorly." The Ceylonese bird, it will be observed, differs from it in being darker on the head and back; it is likewise smaller, the wing of *Y. hardwicki* averaging, according to Mr. Hume, 3 inches; he writes, *loc. cit.*, that typical examples of *Y. gymnophthalmos* have the whole head and back darker; but many specimens from Anjango, in the south of India, differ from some of *Y. hardwicki* from the north *only* in the much darker occiput and nape.

Distribution.—This Pigmy Woodpecker is tolerably plentiful in some parts of Ceylon, and has a wide range, being diffused over nearly all the low country, except perhaps the extreme north of the Vanni and

the Jaffna peninsula, where it may also possibly occur. It is in the south-west of the island and in the Eastern Province where it is most abundant; in the latter part it is particularly seen about the dead trees standing in the beds of all the newly finished tanks. In the Galle district it is a common bird in localities suited to its habits; and about Colombo it is not uncommon, having been procured by myself as near that town as the cinnamon-gardens of Morotuwa. Layard states that he discovered it near the capital in the year 1848. About Uswewa, near Puttalam, Mr. Parker writes me it is common; beyond this in the Northern Province it is sparingly distributed, as far as I have been able to trace it, but, being difficult of discovery on account of its small size, it may often escape observation in that jungle-clad region. It occurs in the Central Province up to about 3000 feet. I have met with it in Pusselawa, Nilambe, Deltota, and parts of Uva, and I have no doubt it is to be found on the Dimbulla and Dickoya side as well.

In India it has been found, as far as present experience proves, only in the south, and even there it has escaped observation until rather recently. Jerdon had evidently seen it, though he had not procured it before the publication of his work, for he remarks, at p. 279, vol. i., "I have reason to believe that another and darker-coloured species is found in the Malabar forests; but whether this may prove identical with one of the Himalayan species or with the Ceylon bird in particular, I cannot now ascertain." Subsequently he satisfied himself of the question; for in his supplementary notes, contained in 'Ibis,' 1872, he writes that the Ceylon species occurs in the extreme south of Malabar and Travancore, and is the bird alluded to in the above-mentioned paragraph. Mr. Bourdillon has procured it in the latter district, whence also Mr. Hume has received numerous specimens, and Mr. Fairbank obtained it in the lower Palanis.

Habits.—This little bird, which, but for the frequent utterance of its shrill little note, would often completely escape observation, lives generally in pairs, and frequents the uppermost branches of trees, often perching *across them* for a short space of time. I have observed it settle thus on a mere twig, and then after a moment's pause sidle down to an adjoining branch. It works much at the broken tops of small dead branches, picking out worms and grubs from the rotten wood. In Rugam tank I observed it breaking off comparatively large pieces of dead surface-wood and searching beneath them for food. It is very fond of the jack-tree; and in the south of Ceylon I have often seen it in the "Dell" or wild bread-fruit trees (*Artocarpus nobilis*), which stand in low cheena wood, having been spared the axe for the sake of the timber. In the Northern Province I have usually observed it in large trees near rivers and tanks, and in the Kandyan country at the edges of coffee-estates or patnas. Its powers of flight, afforded by its long wings, are considerable, and its note, which is a prolonged trill, is audible at some distance, even when uttered at the tops of the loftiest trees.

Mr. Bourdillon's remark on this species, as observed by him in Travancore, is that "it lives in the tops of high trees, and is as difficult to observe as to shoot."

Nidification.—In the Western Province this Woodpecker breeds in February and March, nesting in holes in small branches. A nest which Mr. MacVicar found in the Colombo district, near Poré, was in a dead branch with an opening leading to it of about 1 inch in diameter. There were three young birds in it just hatched, and the egg-fragments were shining white.

Genus CHRYSOCOLAPTES.

Bill very strong, lengthened, the tip wedge-shaped ; lateral ridge very prominent, and parallel to the margin near the tip. Nostrils apart. Neck small. Wings much as in *Picus*. Tail moderately long and cuneate, the four central feathers subequal. Feet very strong, the hind toe considerably longer than the anterior ; claws stout, long, and much curved.

CHRYSOCOLAPTES STRICKLANDI.

(LAYARD'S WOODPECKER.)

(Peculiar to Ceylon.)

Picus ceylonus, Jerd. (*nec* Forster) Ill. Ind. Orn. pl. 47 (1847).

Brachypternus stricklandi, Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 449 ; Jerdon, B. of Ind. i. p. 298.

Indopicus carlotta, Mahl. Rev. et Mag. de Zool. 1854, p. 379 ; id. Mon. Picidæ, pl. 67 (1863).

Brachypternus ceylonus, Jerdon, B. of Ind. i. p. 278.

? *Brachypternus rubescens*, Kelaart, Prodromus, Cat. p. 128 (1852).

Chrysocolaptes stricklandi, Cab. et Heine, Mus. Hein. v. p. 160 (1862); Blyth, Ibis, 1867, p. 297 ; Holdsworth, P. Z. S. 1872, p. 427 ; Legge, Ibis, 1874, p. 15, et 1875, p. 283 ; id. Str. Feath. 1875, p. 200.

Brachypternus erythronotus, Reich. Handb. Spec. Orn. pl. 629. fig. 4186 (1851).

Red Woodpecker, Jerdon's Illustrations ; *Hill-Woodpecker*, Europeans in Ceylon.

Kæralla, Sinhalese.

♂ suprà coccineus, pileo cristato : rectricibus alarum dorso concoloribus : alâ spuriâ et tectricibus primariorum et primariis nigris, his ad apicem pallidioribus et intùs albo ovatè trimaculatis : primariis interioribus secundariisque coccineis, intùs nigris albo trimaculatis : uropygio celatim minutè albido maculato : supracaudalibus caudâque nigris : loris et frontis basi brunneis : regione paroticâ, colli lateribus et collo postico nigris, hôc ovate albo maculato : facie laterali guttureque albidis, fasciis tribus nigris notatis, unâ supragenali, alterâ mystacali, et tertiâ medianâ gutturali : corpore reliquo subtus sordidè rufescenti-albo, plumis nigro marginatis, pectore et jugulo quasi guttulatis, abdomine quasi striolato : margine alari brunneo : tectricibus alarum reliquis nigricantibus albo maculatis : iride flavicanti-albâ ; rostro olivaceo ; pedibus olivaceis.

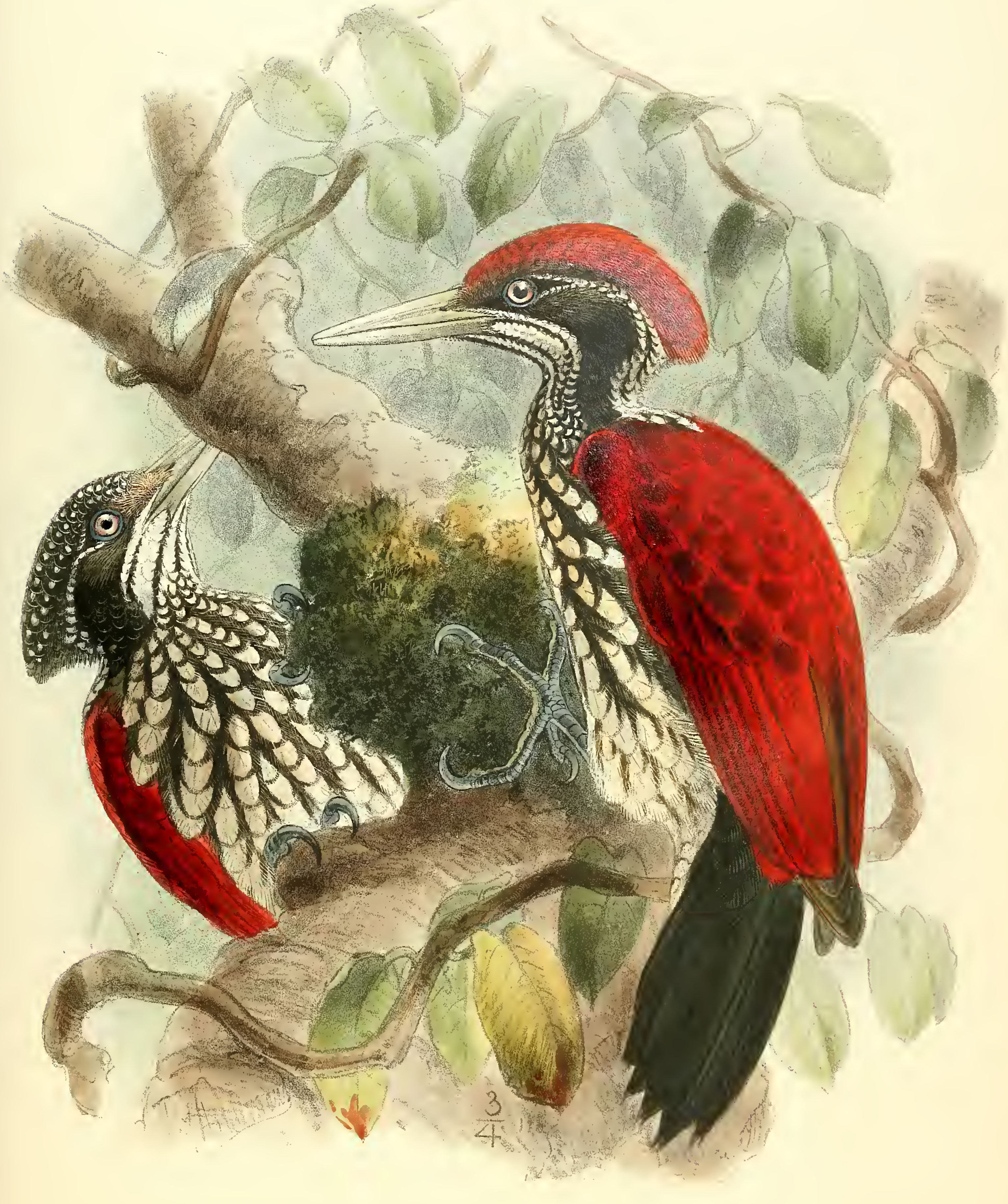
♀ capite nigro, albo punctato.

Adult male and female. Length 11·5 to 11·8 inches ; wing 5·8 to 6·1 ; tail 3·4 ; tarsus 1·0 to 1·1 ; outer ant. toe 0·9. claw (straight) 0·55 ; outer posterior toe 1·1, claw (straight) 0·55 ; bill to gape 1·9 to 2·1.

Females, though quite as large as, and equal in wing to, males, appear to have shorter bills *as a rule*. The claws of this species are very strong and deep.

Iris yellowish white or very pale buff ; bill brownish or olivaceous at the base, changing at the centre into greenish white, the tip assuming a dusky hue ; legs and feet plumbeous green or greenish slate.

Head, nape, back, rump, wing-coverts, outer webs of secondaries, and tertials crimson, dusky on the interscapulars ; bases of the head-feathers brown, and those of the back and rump with concealed white spots ; region round the eye, ear-coverts, and down the sides of the neck blackish brown, paling on the lores and at the base of the upper mandible ; a line of white spots up the hind neck, continued above the ear-coverts to the eyes ; primaries and inner webs of secondaries and tertials black-brown, with a series of white inner-margined spots ; upper tail-coverts and tail black ; throat, cheeks, and a line above the gape to the nostril, centres of throat, chest, and upper breast-feathers,



CHRYSOCOLAPTES STRICKLANDI

and lower parts white; a mesial black line from the chin to the fore neck, and two down each cheek; fore neck and chest-feathers very broadly edged with blackish brown, gradually narrowing towards the lower parts, where it almost disappears; under tail-coverts white, crossed by angular dark bars; under wing-coverts barred white.
The spots on the first primary vary; two is the normal number.

Female. Has the top of the head and the nape black, with round white spots; lores, sides of the neck, and ear-coverts blacker than the male and concolorous with the head; the longer under tail-coverts blackish brown.

Young. The nestling bird has the distribution of the markings the same as in the adult, but they are, together with the ground-colour, less pronounced. A young female before me has the head dull blackish, the spots on crown and forehead *sullied* white, while those of the crest are pure white. The white markings and spottings on the throat are likewise sullied white, the dark edgings are brownish black.
Birds of the year have the bill browner at the base than adults and shorter, measuring, on the average, about 1·85 inch to gape; the iris has a faint tinge of reddish, with a brownish-red outer circle. In some examples the primaries are tipped and crossed with white. Mr. Holdsworth alludes to an example which had the lower part of the back black, faintly barred with white, with crimson feathers appearing among the others.

Obs. Many individuals of this Woodpecker are met with in the low country of Ceylon with the feathers remarkably faded, those which are thus affected being chiefly the primaries at the tips, the coverts at the point of the wing and above the metacarpal joint, as well as on the hind neck; these I have found to be a dun-brown in some, and others a whity brown or greyish colour. The specimens were fully adult; and this singular feature could only have been the result of the action of the sun's rays on the plumage, the birds having frequented exposed situations.
This species is the Ceylonese representative of the South-Indian *Ch. delesserti*; but the latter bird has the back, scapulars, and wing-coverts golden red, and the bill is not so pale. Though first described as a new species by Layard in the 'Annals of Natural History,' 1854, it was previously known to Jerdon from specimens sent from Ceylon, and it was figured by him in his 'Illustrations of Indian Ornithology,' to face his article on *Brach. ceylonus.* It is very closely allied to the Philippine-Islands species *C. hæmatribon*, which differs from it in having the bill brownish, with the base of the under mandible pale.

Distribution.—This Woodpecker, the finest of its tribe in Ceylon, is widely distributed. It has been assigned hitherto to the hills alone, its range not having evidently been worked out; and I am at a loss to understand in what manner its presence in so many parts of the low-country forests has been overlooked by ornithologists collecting in the island. It is found throughout the Central Province from the altitude of the Horton Plains and the Pedro range downwards, but it is, as far as I have been able to trace it out, more plentiful in the higher than in the intermediate forests on the Kandy side. In Uva, however, it is to be found in most forests, following its way down the wooded passes into the low country. It is spread throughout the Eastern Province and the forest-region lying between the Haputale ranges and the south coast, and seems to thrive as well there as in the damp cool regions of the Nuwara-Elliya plateau. I have procured it within a few miles of Kirinde, on the banks of the river there. It is found through all the forest-tract to the north of Dambulla, and inhabits the open woods close to the coast near Trincomalie. Within a few miles of that place I have shot it in an overgrown cocoanut-compound, together with *Brachypternus ceylonus* and *B. puncticollis*! In the Vanni it is common, and extends through the Anaradjapura district and the Seven Korales to Kurunegala and Puttalam, its numbers decreasing as it approaches the damp climate of the Western Province. South of the Deduru-oya it is much rarer. I have met with it in forest near Ambepussa, between Avisawella and Ratnapura, in the Pasdun Korale, and once near Baddegama in the Galle district, the precise locality there being the Government forest reserve of Kottowe.

I believe its numbers to have much diminished in the coffee-districts by the felling of the forest; but, notwithstanding, it seems to be local in its tastes. During several days' wanderings in the Peak forests, a most likely locality for it, I seldom heard its well-known trill, and again in the Knuckles forests I remember to have found it rare.

Layard procured the specimen from which he took his original description at Gillymally near Ratnapura, and mentions Mr. Thwaites getting a large number near Kandy, in which district it was evidently more common then than it is now. Mr. Holdsworth found it "abundant at Nuwara Elliya and in all tree-jungle in that district."

Habits.—Layard's Woodpecker is chiefly an inhabitant of tall forest and timber-jungle, but it is likewise found in tangled woods and groves of jungle which happen to be interspersed with large trees which it principally affects. In the south-east I invariably found it in the tall forest which lined the rivers flowing through that wild region; it shunned the thick thorny jungle clothing the arid land, and resorted to the more luxuriant belts which grew within the influence of the water. I generally found it in similar localities, or near the borders of tanks, in the northern part of Ceylon. In the Central Province it invariably affects the heavy jungle, either above the coffee-estates or in the valleys which have not yet been denuded of their beautiful clothing. It is very shy, always evincing a fear of man, and its habits escape observation by all except those who are much in the jungle. It is very active, working the tallest trees right to the top, and when sounding a hollow branch uses its powerful head and beak in dealing a "rattle" of blows with such inconceivable rapidity that the movement of its head cannot be discerned with the human eye!

This startling sound is produced by the Common Red Woodpecker; but it has not such a loud effect as when executed by the present species. I once watched one of these birds sounding a branch at the top of a lofty Keena-tree in the Lunugalla Pass, and observed that it held its head on one side and listened attentively each time before striking its rattle on the hard wood in order to force the frightened insects from their lair, in doing which it produced a noise which resounded through the forest. These Woodpeckers are usually in pairs not far distant from one another; and when two are running up the same trunk they keep on opposite sides of it, appearing not to wish to interrupt one another, each one suddenly vanishing round the bole on the appearance of the other, which has the effect of a game of "hide and seek." A single bird will work a tree from side to side, crossing and recrossing the trunk rapidly. Its feet and legs are very powerful, and it never seems tired of hunting for its food, which chiefly consists of ants. Its flight is swift, but not sustained for long. I have occasionally seen small parties in company, consisting of young birds with their parents; and on one occasion met with a pair near the Maha-oya, Eastern Province, which were searching about a huge fallen trunk, running along its horizontal surface as they would have climbed a standing tree. Its note is a weak trill, uttered in a high key and prolonged considerably; the voice of one bird is invariably answered by its mate, if within hearing distance.

Nidification.—I know nothing of the eggs of this species; but can state that in the hills it breeds at the beginning of the year, as I once found a nest at Elk Plains in January. It was situated in a hole in rather a small limb high up in a large tree, and the birds by their gestures appeared to have young.

The front figure in the Plate accompanying this article is that of a male shot at the Maha-oya, while the female represents an up-country bird killed at the Horton Plains.

CHRYSOCOLAPTES FESTIVUS.

(THE BLACK-BACKED WOODPECKER.)

Picus festivus, Bodd. Tabl. Pl. Enl. 696 (1783).

Picus goensis, Gm. Syst. Nat. i. p. 434 (1788).

Dendrocopus elliotti, Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. no. 208.

Chrysocolaptes melanotis, Blyth, J. A. S. B. 1843, xii. p. 1005.

Chrysocolaptes festivus, Gray, Gen. B. iii. App. p. 21 (1845?); Blyth, Ibis, 1866, p. 355; Holdsworth, P. Z. S. 1872, p. 427 (first record from Ceylon); Jerdon, Ibis, 1872, p. 8; Adam, Str. Feath. 1873, p. 373; Ball, ibid. 1874, p. 391; Butler et Hume, ibid. 1875, p. 458; Legge, Ibis, 1875, p. 283.

Chrysocolaptes goensis, Blyth, Cat. B. Mus. A. S. B. p. 55 (1849); Jerdon, B. of Ind. i. p. 282 (1862); Reich. Handb. Spec. Orn. p. 400, pl. 655. fig. 4359.

Indopicus goensis, Malh. Mon. Picidæ, ii. p. 82, pl. 66. figs. 1, 2 (1863).

Marram tolashi, Tamils in India (Jerdon).

Kæralla, Sinhalese.

Adult male. Length 11·5 to 12·6 inches; wing 5·8 to 6·0, expanse 19·5; tail 3·0 to 3·6; tarsus 1·05 to 1·2; outer anterior toe 0·9, claw (straight) 0·5; outer posterior toe 1·0, claw (straight) 0·52; expanse of foot with claws 3·0; bill to gape 1·93, height at base 0·42.

The above measurements are from two Ceylonese specimens.

Iris (variable) in one example brownish, in the other crimson-orange; bill dull blackish or leaden horn-colour, darker at the tip; legs and feet greenish slaty, claws bluish horn or brownish ochraceous.

Head and crest bright but pale crimson, bordered by a broad blackish superciliary stripe, commencing at the nostrils and encompassing the occiput; forehead joining the supercilium brownish, bases of the head-feathers black; a broad stripe from the eye to the nape and thence spreading over the hind neck and interscapular region; throat, fore neck, lower part of face, and lower half of lores white; back, rump, upper tail-coverts, scapulars, least wing-coverts, and on each side of the white, passing up the side of the neck to the eye, brownish black; tail black: primaries and their coverts, inner webs of secondaries, and tertiaries blackish brown, with large round marginal spots to the quills, and corresponding greyish markings on the outer webs; throat with a dark mesial stripe, and two more down each cheek as in the last; beneath white, feathers of the throat and chest broadly edged with blackish brown, which diminishes to a narrow margin on the lower parts; under tail-coverts white with dark centres, the lower feathers entirely brown.

Female. Indian examples (I have not met with a Ceylonese specimen) have the crown and occipital crest light yellow, of a more orange hue than the colour of the wing-coverts; the forehead is spotted with white as in the last species; the wing-coverts a duller yellow than in the male. Blyth remarks that some females have the yellow crest tipped with crimson.

Young. A young male, shot by Mr. Parker in the Puttalam district, has the crest-feathers yellow, tipped with orange-red; the superciliary feathers brown and black, and those of the forehead black, marked or spotted with white, the latter colour predominating near the base of the bill.

Obs. Ceylonese examples appear to be altogether smaller and less robust than, and with the bills not so stout as in, Indian specimens; the black and white markings about the neck and throat are more open or bolder in the Indian bird, and this is especially noticeable in the lateral stripes leading down from the chin, in the black patch on the ear-coverts, and in the white stripe over the ears; the forehead, in the continental males, is conspicuously white, and the white centres of the chest-feathers more pronounced. A male in my collection, from Raipoor, measures

6·1 in the wing, bill to gape 2·2; another from the North-west Provinces, in the national collection, 6·1, the bill to gape 2·2; a female from the same locality 6·3, bill to gape 2·15, height at base 0·5. Mr. Ball records a male from Chota Nagpur as 6·3, and a female 6·1. The Raipoor specimen has the forehead all white, the feathers having black bases, and the crimson of the crown and crest is deeper than in my southern Ceylon example.

Distribution.—This is one of our rarest Woodpeckers, for though it is not uncommon in one or two districts, yet the localities that it has been hitherto known to frequent are few and far between. The first examples procured in the island were sent to Lord Walden in 1865, and were a male and female, obtained in a locality called Cocarry, the whereabouts of which I have been unable to determine; but Mr. Holdsworth is of opinion that the birds were shot somewhere in the north-west of the island, as they were part of a collection made not far from Aripu. Further south, in the forests between Puttalam and the Seven Korales, it is, I am informed by Mr. Parker, not unfrequent, he having seen more than a dozen specimens in the jungles round Uswewa. I have never met with it but once, and that was on the Kirinde Ganga, a few miles from Tissa Maha Rama, in the south-east of Ceylon. I there procured a male of a pair which I saw in March 1872. The species should be looked for by future collectors in the forest on the banks of the Kattregama-oya, Koombookam Aār, and other rivers of the Park country, as this district is one which abounds in Woodpeckers. Mr. Parker procured a male near Uswewa in February 1876, and another in July 1877.

In India the Black-backed Woodpecker has a tolerably wide distribution. Jerdon remarks of it that it is "found in various districts of the peninsula and Central India, being rare in most parts and common in a few localities." He found it in the Eastern Ghats, in parts of Mysore, between Bangalore and the Nilghiris, in the Vindhyan Mountains near Mhow, and in the hilly and jungly districts of Nagpore, between that and the Nerbudda. Referring to our excellent Indian journal, 'Stray Feathers,' we find Mr. Bourdillon omitting it in his Travancore list, and likewise Mr. Fairbank from the Palani-hills birds. Jerdon also states that it is not found in the Malabar forests; and therefore its place would seem to be taken in these regions by the common species *C. delesserti*, the above-mentioned districts all lying to the north of latitude 10°. In Chota Nagpur, Mr. Ball met with it on one occasion in the Palamow subdivision, and again in the Satpura hills. From the Central Provinces I have an example mentioned above; and to the north-west of this district, besides inhabiting the Vindhyan mountains, it is found in the Sambhur-Lake region, concerning its distribution in which Mr. Hume writes, "Dr. King shot this species in the jungles at the foot of Aboo. I got it in similar jungles further up the Aravallis; and Adam obtained it again near Koochamun, which is near the north-west extremity of the Sambhur Lake. It is quite foreign to the plains region (Guzerat), and is unknown in Sindh Cutch, Kattiawar, and Jodhpoor."

It was originally, as its name implies, sent from the Goa district, near which it has also been procured in the southern Mahratta country.

Habits.—This species frequents forest and jungle-clad country like the last, and is similar to it in its general habits. It is found working on the trunks of both large and small trees, and is very active in its movements, appearing likewise, from my small experience of it, to be shy in its nature. The note which I heard it utter was a weaker trill than that of Layard's Woodpecker, and much resembled the voice of the little Mahratta Woodpecker. I am indebted to Mr. Parker for several notes on its habits, one of which relates to its cry, which he says is not so loud nor so prolonged as that of *Brachypternus ceylonus*; it would therefore seem to have two distinct calls, like this last-mentioned and other species. One of his specimens was shot in the act of fighting with the Common Red Woodpecker for the possession of a hole for (I presume) breeding-purposes. He writes me that they frequently fight with this species, whose aggressive propensities necessitate it; he thinks that the great numbers of *Brachypternus ceylonus* in the north-western forests may perhaps prevent the Black-backed Woodpecker from spreading over the country, for these latter have "to fight pretty nearly every day before they can call their house their own, and must find their life a burden to them. With their powerful bills" (he remarks) "and well-formed muscular bodies, they are more than a match for the Red Woodpeckers; but the latter do not hesitate to attack them, when the two species chance to meet in the same tree." The stomach of an example he shot contained insects and seeds, two of which latter were as large as peas. Mr. Ball saw one of them feeding on the ground where jungle and grass had recently been burnt, and

writes that he saw and shot three which were busily engaged in searching the branches of a cotton-tree (*Bombax malabaricum*).

Nidification.—I am unable to give any information concerning the breeding-habits of this species. Mr. Parker observed a pair in July, engaged in making a hole in a tree standing in a submerged tank-bed, but was unable to get the eggs.

Subfam. GECININÆ.

Bill wider at the base than in the last subfamily; culmen more curved, the lateral ridge slight, in some genera absent; gonys short. Feet with the outer posterior toe shorter than the outer anterior one; hind toe small, obsolete in some.

PICARIÆ.

PICIDÆ.

GECININÆ.

Genus GECINUS.

Bill rather short; upper mandible widened at the gape; culmen curved, lateral ridge near and parallel to it; nostrils partially concealed. Wings with the 1st quill short, and the 4th and 5th subequal and longest. Tail moderately long and pointed. Feet strong, with the anterior longer than the posterior toe; claws very strong and deep.

GECINUS STRIOLATUS.

(THE STRIATED GREEN WOODPECKER.)

Brachylophus squamatus, Jerdon, Cat. Birds S. India, Madr. Journ. 1840, xi. p. 213. no. 210.

Picus striolatus, Blyth, J. A. S. B. 1843, xii. p. 1000; Sundevall, Consp. Av. Picidæ, p. 60 (1863).

Picus squamatus, Jerdon, 2nd Suppl. Cat. B. S. India, Madr. Journ. 1844, xiii. p. 138. no. 210.

Brachylophus xanthopygius, Hodgson, Cat. Nepal Birds, p. 85 (1845).

Gecinus striolatus, Blyth, Cat. B. Mus. A. S. B. p. 57 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. no. 962 (1854); Jerdon, B. of Ind. i. p. 287 (1862); Legge, Str. Feath. 1873, p. 488 (first record from Ceylon); Ball, ibid. 1874, p. 391; Hume, ibid. 1875, p. 68; Butler, ibid. p. 458; Inglis, ibid. 1877, p. 26; Fairbank, ibid. p. 396; Ball, ibid. p. 413.

Gecinus xanthopygius, Bonap. Consp. Gen. Av. p. 127 (1850).

Chloropicus striolatus, Malherbe, Mon. Picidæ, pl. 77, p. 134 (1862).

The Lesser Indian Green Woodpecker, *The Small Green Woodpecker*, Indian authors.

Adult male and female. Length 10·5 to 10·9 inches; wing 5·1 to 5·3 (a female measures 5·2); tail 3·8; tarsus 1·0; outer anterior toe 0·8, claw (straight) 0·42; outer posterior toe 0·75; bill to gape 1·45 to 1·6. Weight of male $3\frac{1}{2}$ oz.

Iris reddish, with a frosted silver outer circle; bill blackish, the upper mandible with a pale edge, lower mandible yellow, with the tip dusky; legs and feet dusky greenish. Mr. Oates describes the eyelid in Burmese specimens as bluish grey.

Male. Forehead, crown, and occiput dull crimson, bounded by a black line passing from the upper part of the lores over the eye to the nape, where it spreads out into a crest in continuation of the red of the hind head; below this line a white streak passing from above the eye to the nape; lores and cheeks dusky whitish, the latter with a black stripe formed by the centres of the feathers; ear-coverts greenish grey; back and wings dull green, changing on the rump and upper tail-coverts into yellow, with a wash of orange on the centre of this part; primaries, inner webs of tertials, and all the secondaries, except the green external portion, dark brown, with a series of external white spots on the primaries, and inner white marginal bars towards the bases of all the quills; secondaries with pale indentations at the inner edge of the green portions; tail blackish brown, with interrupted or marginal bars of greenish grey on the central feathers, the remaining feathers with dusky bars and pale edges.

Beneath greenish grey of different depths, darkest on the chest and palest on the lower parts, each feather with a sub-edging of brown, forming a lanceolate mark; on the flanks and parts of the breast there is a central stripe as

well, and the markings on the throat are confined to these mesial lines; under wing-coverts with arrow-shaped bars, and the bases of the under tail-coverts with a central spear-shaped mark.

Female. Has the crown as well as the nape black, the ear-coverts darker, and the throat perhaps duskier, as a rule. than in the male; the frontal feathers are pale-edged, the central portions only being black.

Obs. The under surface of this Woodpecker is variable in appearance, owing to a discoloration of the feathers; it is only in new plumage that the green hue of the chest and breast is pure; it soon becomes sullied, and scarcely any two specimens (at least according to my experience of a tolerably large series of Indian and Ceylonese individuals) have the lower parts of the same hue, some being completely brownish, the green tint of the central portions of the feathers being only perceptible on close examination.

Ceylonese examples are identical with Indian in plumage, and are quite equal to the general run of these in size. From an examination of a series in the national collection, from Nepal and other districts, I find that the wings in the males vary from 4·9 to 5·2 inches, and in females from 4·8 to 5·0. Mr. Ball's tabulation of Chota-Nagpur specimens shows the wing in 3 males as 5·05 inches, and in a female as 4·95; the bills in these specimens are remarkably long, varying from 1·6 to 1·7. A female from the Palanis measures—wing 5·0, bill from gape 1·4. Burmese examples are large: wing 5·3 to 5·55.

This species is tolerably closely related to three others, viz. *G. viridanus* from Burmah, *G. squamatus* from the Himalayas, and *G. dimidiatus* from Java. It is most nearly allied to the first named, which Jerdon calls "a duplicate of it." *G. viridanus*, however, is a larger bird: the wings in a male measure 5·4 and in a female 5·6 inches. It has a greener under surface, the quills are much darker, and the rump is not so yellow as in *G. striolatus*; the black superciliary line is bolder in the male, and the black moustachial band broader, with the feathers conspicuously white-edged. In the female the forehead is uniform black, and the cheek-band much more pronounced; while the quills and rump present the same distinction as in the male.

G. squamatus is also considerably larger than *G. striolatus*, and has the scale-like markings of the under surface confined to the lower breast and abdomen. The forehead in the female is again uniform black, and not edged with whitish, as in *G. striolatus*.

G. dimidiatus is about the same size as *G. striolatus* (wing 5·0 inches), with the bill perhaps shorter as a rule. The fore neck and chest is uniform green, the breast and lower parts with conspicuous, blackish, scale-like markings; rump not so yellow as in *G. striolatus*; in the female, as in the last, the forehead presents the same peculiarity, being quite black.

Distribution.—This Woodpecker has a restricted range in Ceylon, being, as far as is yet known, quite a hill-bird. Until late years it escaped all observation, and had no place in the Ceylon lists, which was owing to the imperfect exploration of the patnas in the Central Province, to which it is almost entirely restricted.

The first specimen brought to the notice of the ornithological world was killed in 1872 in the Pusselawa district, and was recorded by me, *loc. cit.* Mr. Laurie procured a female example about the same time in the Knuckles district. Subsequently Mr. Bligh obtained a pair in the Haputale ranges, the shooting of which was recorded in the 'Observer.' These were killed at an elevation of 4500 feet, and others have since been shot by him at the same elevation near the Catton estate. It is more plentiful in the Uva patna basin (*i. e.* the great stretch of grassy scrub-covered hills extending across from Udu Pusselawa to the northern slopes of the Haputale hills) and in the district beyond Badulla than in any other part, save perhaps the similarly featured country below Hangrankette. I have shot it near Lunugalla, and on the Logole-oya in Madulsima, and likewise in the valley in Lower Hewahette; and I once met with it in the low-lying patnas at the foot of the Hewa-Elliya range at an elevation of about 1000 feet.

It is not improbable that it will be found in the Rakwana district, and perhaps on the Karawita hills; and in the Central Province it may possibly extend considerably down the valley of the Mahawelliganga, where the country is open, grassy, and dotted with scattered timber.

On the mainland this Green Woodpecker enjoys an extensive range, being found in Southern and Central India and in the Himalayas. Jerdon remarks that he has seen it in Malabar in low jungle near the sea, in bushy ground on the Nilghiris and on the Eastern Ghâts, and also that it occurs rarely near Calcutta.

In the Palani hills Mr. Fairbank procured a single specimen at 4000 feet elevation; but he remarks that it is absent from the Khandala district. Mr. Ball's experience of it is that it is rare in Chota Nagpur and more abundant in the Satpura hills, and that it occurs sparingly throughout the coast-region lying between the Mahanadi and Godavery rivers. In the north-west it is local; Captain Butler procured it in the jungles

at the foot of the Arawalli range, and this is the only locality in all that region in which it is, according to Mr. Hume, to be found.

It is found in the Doon and in Kumaon, as well as in the sub-Himalayan tracts; and Mr. Inglis writes that in Cachar "it is very common during the cold weather, and also often seen in the rains." It extends thence to Assam and Upper Pegu, where it is, according to Mr. Oates, very common.

Habits.—The Striated Green Woodpecker frequents stunted trees dispersed about the patnas and bare hill-sides in the Central Province, and being of a retiring, shy disposition, resorts mostly to the numerous ravines with which these districts are cut up. Jerdon remarks that it not unfrequently descends to the ground and feeds there; this I have seen it do myself, and have more than once observed it searching about the stems of quite small bushes. When flying off to a tree it generally alights at the bottom of the trunk and works the whole tree to the top, devoting most of its time to the small branches, from one to the other of which it flies before going to another tree. It is very active and also shy, being a most difficult bird to procure. When aware that it is being pursued it flies quickly from tree to tree, and leads the collector such a chase as soon leaves him breathless on the steep patnas up which he has been toiling under a blazing sun, baffled in his pursuit and listening to the restless Woodpecker's singular "*queemp*" cry as it disappears over the brow of the nearest rise! It is constantly uttering this note, and by it I have always discovered its whereabouts. It is nearly always in pairs; but on one occasion I discovered four in a wood in Madulsima, which were probably a young brood with their parents. I have reason to believe that it roosts *perched across* a branch, as I once shot at one in the dusk of the evening that had flown into the top of a tree above my head and had taken up that position. Mr. Bligh has met with it in coffee-plantations frequenting dead stumps of trees; but it does not appear to reside in such localities, merely visiting them from the neighbouring patnas. I have found its diet to consist almost entirely of black ants, which abound in the trees in the Central Province. It is very local, dwelling, I believe, in one spot, for it may be heard day after day in the same place.

Nidification.—In India this species lays from March until May, building, according to Mr. Hume, in holes in trunks or branches of trees. The eggs are four or five in number, "pure china-white and very glossy;" they vary from 1·02 to 1·1 inch in length, and from 0·74 to 0·85 inch in breadth.

Genus CHRYSOPHLEGMA.

Bill shorter than in *Gecinus*, widened at the base, with the lateral ridge well defined and parallel to the culmen, which is curved. Nostrils concealed by hair-like plumes; gonys short. Tail long and cuneate, the central feathers considerably attenuated. Feet with the anterior toe longer than the posterior; claws strong and well curved.

CHRYSOPHLEGMA XANTHODERUS.

(THE SOUTHERN YELLOW-NAPED WOODPECKER.)

Picus mentalis, Jerd. (*nec* Temm.) Cat. B. S. India, Madr. Journ. 1840, xi. p. 214. no. 211.

Chloropicus xanthoderus, Malh. Brit. Mus. 1844, et Rev. Zool. 1845, p. 402, et Monog. Picidæ, pl. 75, vol. ii. p. 114.

Picus chlorigaster, Jerd. Cat. B. S. India, Madr. Journ. 1845, xiii. p. 138. no. 31.

Gecinus chlorophanes, Blyth (*nec* Vieill.), Cat. B. Mus. A. S. B. p. 59 (1849); Kelaart, Prodromus, Cat. p. 128 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 448.

Chrysophlegma chlorophanes, Jerd. B. of Ind. i. p. 290; Holdsworth, P. Z. S. 1872, p. 428; Bourdillon, Str. Feath. 1876, p. 390; Fairbank, ibid. 1877, p. 396.

Picus xanthoderus, Sundev. Consp. Av. Picid. p. 58 (1863).

Green Woodpecker, "*Ground-Woodpecker*," Europeans in Ceylon.

Pachcha kœralla, Sinhalese.

Adult male and female. Length 8·7 to 9·2 inches; wing 4·5 to 4·75; tail 2·9 to 5·5; tarsus 0·75; outer anterior toe 0·7, claw (straight) 0·38; posterior outer toe 0·65; bill to gape 1·0 to 1·05. Females appear to average smaller than males.

Iris sombre red or brownish red; bill blackish, with the sides of the lower mandible and margin of the upper next the gape yellow; legs and feet olive-greenish or dusky sap-green.

Head, crest, and a patch on the lower part of cheeks crimson, the feathers of the nape below the crest rich yellow; bases of forehead and crown-feathers greenish black; upper surface with the wing-coverts bright olive-green; face, throat, neck, and under surface dull green; lores blackish, round the eye and on the cheeks the feathers are somewhat dusky; outer webs of inner primaries, secondaries, and tertials next the shaft orange-red; greater wing-coverts with their bases orange; inner webs of quills brown, with distant white spots, and the terminal portion of the outer webs of the primaries with whitish spots; tail black; beneath, the sides of the breast, flanks, and lower parts are barred with white; bases of throat-feathers white, showing more or less on the surface; under wing-coverts marked with greenish white.

Female. Has the forehead and head deep green, the bases of the feathers dark brown; the occipital feathers and yellow nape-patch as in the male, but the red cheek-stripe absent, that part being green like the sides of the neck.

Young. Birds of the year have the forehead dark green, and the feathers tipped with the crimson hue of the occiput; the fore neck and throat are brownish, and the dorsal feathers to a certain extent tipped with a pale hue; flanks and lower parts more barred with white than in the adult.

Obs. Ceylonese specimens correspond well with those from Madras. A male from this locality measures 4·7 inches in the wing, bill to gape 1·1; a female 4·6 in the wing, bill to gape 1·1. This species is closely allied to *Ch. chlorophus*, its northern representative, which inhabits Bengal, Assam, and parts of the sub-Himalayan hills. This is a larger bird, two males from Nepal measuring 5·5 and 5·6 inches in the wing, and a female 5·4; it has the hinder part of the head green, a band of red passing across the front of forehead over the lores and eyes to the occiput, where it occupies the terminal half of the nuchal feathers, while the nape and upper part of the hind neck are light

saffron-yellow, richer in hue than in *Ch. xanthoderus*, and the wing-coverts are not so much washed with red as in this latter species.

The female wants the red stripe across the forehead and over the eyes; the under surface is greyish, and less washed with green than in *C. xanthoderus*.

This Woodpecker has been styled by Jerdon and Blyth, and consequently by Layard and other writers on Ceylon ornithology, *Chrysophlegma chlorophanes*, owing, apparently, to a mistake made by Blyth in quoting Vieillot as the author of the species at page 59 of his Catalogue of the Birds in the Asiatic Society's Museum, Calcutta; he there gives as a synonym of *Ch. chlorophanes*, "*Picus chlorophanes*, Vieillot." Vieillot, however, gave no such name in his 'Dictionary,' as Malherbe remarks in his article on the present species and on *Ch. chlorolophus*. I have myself examined the pages in his vol. xxvi., devoted to the Woodpeckers, and cannot find any reference to any other Green Woodpecker from India but that relating to the *Pic à huppe verte* from Bengal. The species, then, in reality wanted a name until Malherbe met with specimens of it in the British Museum, sent there by Jerdon from South India, and described it under the above title. Blyth, by an error, quoted this name as a synonym of *Ch. chlorolophus* at page 58 of his Catalogue.

Distribution.—The "Ground-Woodpecker" is found throughout most of the low country, except the northern parts, where, as far as I am able to ascertain from report and my own observation, it has not yet been detected. As it is, however, nowhere very abundant and is of a retiring nature, it may have been passed over in the north of the Vanni, and it will be for future explorers to extend its limit to that part of the island. It is not unfrequent near Colombo, and is diffused generally throughout the Western Province, being perhaps most common in parts of Saffragam and in the Raygam and Pasdun Korales. In the south-west it is not uncommon both in the hill-region and the wooded country lying between the "Haycock" and Galle. On the eastern side of the island I have found it in the Friars-Hood and other districts; I met with it also in the Wellaway Korale, and it most likely inhabits most of the Park country between there and Batticaloa. In the Kandyan Province it is found in the valleys intersecting the coffee-districts, but more particularly on the Uva side, where I have seen it at an altitude of 4000 feet. It was not uncommon about Lunugalla, inhabiting the jungle on the pass down to Bibile. Kelaart says that it is not unfrequently seen at Nuwara Elliya; but I know of no one else who has seen it there.

In the south of India this Woodpecker is not uncommon. Jerdon writes that it is "found in the forests of Malabar, more especially far south, as in Travancore." In this district Mr. Bourdillon says it is very common; and Mr. Fairbank obtained it in the Palani hills at a considerable elevation. It seems to be restricted to the extreme south of the peninsula; for Jerdon did not find it in the Eastern Ghâts nor in Central India, and Mr. Fairbank does not record it from the Deccan.

Habits.—This species affects the edges of forest and also the interior of the jungle, being partial to wooded ravines through which streams run, near the banks of which I have more than once met with it. It is also found in scattered jungle and low thickets, and may often be surprised on the ground in dense underwood. But though it is found so much near the ground, tapping about the roots of trees and searching for food on fallen timber, it nevertheless often betakes itself to the very tallest trees of the forest, and has a habit of mounting up to the very topmost branch and there remaining motionless for some time, uttering its loud monosyllabic note, which somewhat resembles that of the Bay Woodpecker. It is when not feeding or on sallying out the first thing in the morning that it utters its note; and sometimes when flying across an open glade or cheena, as I have noticed it in the Eastern Province, it gives out its plaintive pipe; but otherwise it is not a very noisy Woodpecker. When disturbed in the thick jungle, if it be on the ground, it decamps from tree to tree with a loud fluttering of the wings, and clings to the trunks near the roots. When on the wing for any distance its flight is performed with quick beating of the wings and long intermediate jerks, by which it progresses with considerable speed.

Layard writes that he has seen it on the ground "in pairs, breaking into the dried masses of cow-dung in search of Coleoptera. On being alarmed it takes refuge in the nearest tree or bush, and displays all the arboreal activity of its tribe, climbing round the branches and evading the eye by carefully keeping on the opposite side of the limbs."

Besides feeding on coleopterous insects, it is very fond of ants, with which I have found its stomach crammed.

In the breeding-season, which in Travancore apparently is in March, Mr. Bourdillon says that the "plaintive monotonous call of these birds (which somewhat resembles the breeding-call of the common Pariah Kite) may be heard at all hours of the day as they cling motionless to the topmost bough of some tall forest tree."

I know nothing of its nidification.

Genus MICROPTERNUS.

Bill short, wide at the base; culmen much arched or curved, lateral ridge almost obsolete and close to the culmen; gonys straight, its angle sharp. Wings much as in other genera of the family, but with the secondaries long. Tail rather short, broad at the base. Tarsus about equal to the anterior toe, which is longer than the versatile one; claws much curved.

Of chestnut plumage.

MICROPTERNUS GULARIS.

(THE MADRAS RUFOUS WOODPECKER.)

Picus badius, Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. no. 214.

Micropternus gularis, Jerdon, 2nd Suppl. Cat. B. S. India, Madr. Journ. 1845, xiii. p. 139; Blyth, Cat. B. Mus. A. S. B. p. 61 (1849); Kelaart, Prodromus, Cat. p. 128 (1852); Jerdon, B. of Ind. i. p. 294; Holdsw. P. Z. S. 1872, p. 428; Hume, Str. Feath. 1873, p. 431; Legge, ibid. 1875, p. 201; Hume, ibid. 1877, p. 477.

Micropternus phaioceps, Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 450.

Phaiopicus jerdoni, Malherbe, Rev. Zool. 1849, p. 535; id. Mon. Picid. pl. 47. figs. 1–4 (1862).

The Bay Woodpecker of some; *Brown Woodpecker*, Europeans in Ceylon.

Karalla, Sinhalese.

Adult male. Length about 9·5 inches; wing 4·5 to 4·7; tail 2·75; tarsus 0·75; outer anterior toe 0·75 to 0·8, its claw (straight) 0·4 to 0·42; outer posterior toe 0·65 to 0·7; bill to gape 1·15 to 1·3. The bill, considering its small size, is somewhat variable in length.

Iris chestnut-brown in some, brownish red in others; bill black, with a slate-coloured or sometimes a greenish line at the sides of the lower mandible; legs and feet "slaty" or blackish plumbeous.

General plumage rufous-bay, with a dusky hue on the under surface; head, region round the eye, and cheeks infuscated with brownish; the feathers extending from the gape beneath the eye to the ear-coverts tipped with crimson, and occasionally those in front of the eye faintly pointed with the same; the feathers of the lower part of the hind neck and all the upper surface beneath that part crossed with bars of brownish black, narrowest on the back and broadest on the inner webs of the quills and tertials; tail with the central feathers deeply tipped with blackish, and the remaining bars five in number; the three lateral feathers with the subterminal bar the same width as the rest; chin- and throat-feathers crossed with blackish-brown subterminal bars and tipped with whitish; flank, sides of belly, and under tail-coverts barred with a lighter brown than the back; first three primaries with a brown patch on the inner webs; under wing-coverts crossed with narrow bars of brownish black.

Though the extent of the crimson tipping on the cheeks varies, I have not yet seen a Ceylonese specimen with it above the anterior angle of the eye, as is the case with the closely allied *M. badiosus*.

Female. Slightly smaller; wing 4·5 inches; bill to gape 1·1 to 1·25.

The rufous plumage paler throughout than in the male, at least in most specimens that I have examined; cheeks wanting the crimson colour.

Young. In what *appears* to be an immature male bird, the feathers of the head are edged with rufous-bay, and the crimson cheek-patch is very small in extent; the chest and breast have the feathers crossed with crescentic bands of brown.

Obs. This species is said to vary in size from different parts of South India: I find no appreciable difference between western, southern, and northern specimens in Ceylon; they average, as is the case with most Indo-Ceylonese forms, smaller than the continental birds. Mr. Hume, in his exhaustive notice of the genus ('Stray Feathers,'

1877), gives the wings of a series taken at random from the "Nilghiris, Ceylon, and Travancore as 4·72, 4·85, 4·75, 4·68, 4·71, 4·6, 4·78, 4·85, 4·8, 4·7;" all but three of these dimensions exceed the maximum of Ceylon birds. He remarks that the tail-bands are usually six in number: I take it for granted that the black tip, 0·6 to 0·8 inch in depth, is not included in this number; and if so, most Indian birds must have an extra band on the caudal feathers. Lord Tweeddale records an instance of a Malabar specimen having the crimson "points" quite round the eye; this appears to be a characteristic distinction of *M. badiosus* from Borneo. Ceylonese females are quite as pale as South-Indian.

Perhaps no genus of Woodpeckers has its members so closely allied as this; the different species have a general resemblance to one another, but yet possess certain nice points of distinction peculiar to types from certain regions which serve to assign them to specific rank. *M. phaioceps* from Bengal is a larger bird than ours: wings 5·1, 5·3, 4·7. It is paler on the head, and has the white-margined feathers of the throat concolorous with the fore neck and chest. *M. brachyurus* (or *M. badius*), according to Mr. Hume, has the white-tipped throat-feathers banded with dark brown like *M. gularis*; but they extend on to the cheeks, whereas in the latter they do not surmount the rami of the lower mandible; the head is paler than in *M. phaioceps*, and the crimson dotting of the face the same in extent, or not extending above the angle of the eye: this species inhabits Java, and to it Mr. Hume unites the bird from Tenasserim. The fourth species (*M. badiosus*) differs solely in the red points extending round the eye; but this would seem to be the case, in isolated instances, with some individuals from Malabar.

Distribution.—This bird has hitherto been considered rare in Ceylon, and likewise of local distribution. It is, however, widely distributed, for I have met with it in all my wanderings through the low country. It is less common, I think, in the north than elsewhere; but yet I have seen it in many parts of the forest-clad country from Tamblegam to the neighbourhood of Anaradjapura. It is found within four miles of Colombo, and is pretty evenly diffused throughout the Western Province: in the south I have met with it chiefly near the Gindurah, and in the south-east found it at Tissa Maha Rama and other places; it is not uncommon in parts of the "Park" country, and I have met with it near Nilgalla; but in all these districts of the eastern portion of the island it is likely to be passed over unless the collector be well on the alert, for it is found usually in the wilder parts of the forest, where the jungle is thin and scattered or interspersed with open glades. In the Seven Korales it is pretty common, and Mr. Parker writes me that it is numerous about Uswewa. It occurs in the valley of Dumbara; but I do not know that it ascends much higher than that. Mr. Bligh has seen it in Haputale up to about 2000 feet. In the peninsula of India it is found "in the forests of Malabar, both above and below the Ghâts, from the extreme south to north latitude 16°." At the latter extreme it is rarer than further south. Mr. Fairbank records it from Khandala and Mahabaleshwar, where it inhabits the western slopes of the hill-ranges. Further north than this I do not think it has been met with. It is, I imagine, more common on the Nilghiris and the adjacent Malabar coast than in the extreme south, for I do not find it recorded either from the Travancore or Palani hills.

Habits.—The Bay Woodpecker is an active and restless bird, astir the first thing in the morning, making its loud note, *queēmp-queep*, heard before many other birds have begun to think about their morning rambles! It is found in thick forest, in compounds filled with cocoanut, bread-fruit, and jack trees, at the borders of jungle-begirt paddy-fields, and in detached woods. It usually mounts to the top of a tree, and selecting some dead branch, taps away at it, diligently listening in the intervals until its luckless prey is discovered. It may be approached easily when thus engaged, and when disturbed does not fly far. It goes more on the ground, I think, than the last species, for I have several times surprised a pair breaking up dried cattle ordure; and on one occasion, in the north of Ceylon, came on one busily attacking a stream of black ants as they filed in close order, a dozen abreast, across a jungle-path. This insect, the short black ant (*Formica exundans*?), forms the Bay Woodpecker's favourite food in the forest districts; it attacks the large black pendent nests which it constructs and entirely consumes its numerous inhabitants. Mr. Parker writes me that he once descried an individual issuing from a round hole in a large nest, and found, on examining it, that the interior was completely hollowed out. When flushed from the ground it rises with a loud flutter to the nearest tree, and often flies suddenly from branch to branch, and so decamps to another place of safety. I have more than once found its breast smeared and discoloured with some viscous substance, which must be the gum from the bark of certain trees. Its flight is very jerky and not swift, being performed with alternate beating and closing of the wings.

I am unable to furnish any information concerning this bird's nesting.

Genus BRACHYPTERNUS.

Bill moderately long, with the culmen curved, wide at the base, with the nostrils apart; gonys short and straight. Wings and tail moderate; the latter cuneate, the central feathers slightly exceeding the next. Tarsi rather short; anterior toe longer than posterior; *hind toe minute*, and its claw *rudimentary*.

BRACHYPTERNUS CEYLONUS.

(THE RED WOODPECKER.)

(Peculiar to Ceylon.)

Picus ceylonus, Forster, Naturf. xiii. pl. 4.

Picus erythronotus, Vieill. N. Dict. d'Hist. Nat. xxvi. p. 73 (1818).

Picus sonneratii, Less. Traité d'Orn. p. 221 (1831).

Brachypternus erythronotus, Strickl. P. Z. S. 1841, p. 31.

Brachypternus ceylonus, Blyth, J. A. S. B. 1846, p. 282; id. Cat. B. Mus. A. S. B. p. 56 (1849); Kelaart, Prodromus, Cat. p. 128 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 449; Cab. et Heine, Mus. Hein. v. p. 171 (1863); Blyth, Ibis, 1867, p. 297; Holdsworth, P. Z. S. 1872, p. 428; Legge, Ibis, 1874, p. 15, et 1875, p. 284; id. Str. Feath. 1875, p. 202.

Brahmapicus erythronotus, Malherbe, Mon. Picidæ, ii. p. 90, pl. 69. figs. 1–4 (1863).

Red Woodpecker, *Cocoanut-Woodpecker*, Europeans in Ceylon; "*Toddy-bird*," natives in south of Ceylon.

Pastru carpentaru, Portuguese in Ceylon, lit. "Carpenter-bird" (from its habit of tapping trees).

Kœralla, *Keberella*, Sinhalese; *Tatchan-kuruvi*, Tamils in Ceylon.

♂ *ad.* suprà coccineus, colli et dorsi postici plumis basaliter nigris: uropygio nigro sordidè coccineo lavato: supracaudalibus caudâque omnino nigris: tectricibus alarum coccineis, basaliter nigris, et pallidè coccineo apicaliter maculatis: remigibus nigris, albo fasciatim maculatis, primariis extimis pogonio interno tantùm notatis, secundariis extùs dorso concoloribus: plumis superciliaribus nigris albo minutè punctatis: facie laterali fulvescenti-albidâ nigro striolatâ: genis et gulâ fulvescentibus nigro maculatis: gutture imo nigro: corpore reliquo subtùs fulvescente, plumis nigro marginatis: hypochondriis, subcaudalibus et subalaribus transversim nigro fasciatis: rostro saturatè corneo, mandibulâ cyanescenti-corneâ: pedibus sordidè viridibus: iride rubrâ.

Adult male and female. Length 11·4 to 11·75 inches; wing 5·2 to 5·65; tail 3·5 to 4·0; tarsus 1·0; outer anterior toe 0·8, its claw (straight) 0·45; outer posterior toe 0·7; bill to gape 1·5 to 1·6.

Iris red, dull red, or reddish; bill blackish, base and sides of under mandible leaden; legs and feet murky greenish, olivaceous green, or dusky sap-green.

Male. Head and crest, back, scapulars, and wing-coverts, with the outer webs of secondaries, tertials, and inner primaries crimson, brightest on the crest and back, and merging into the black of the rump; bases of the head-feathers black, those of the forehead being pointed or tipped with black; throat, fore neck, space behind the eye, hind neck, upper tail-coverts, and tail black; a stripe from behind the eye to the nape, and a broader one from the gape down the cheeks and sides of the neck to the chest white; ear-coverts striated, and throat closely spotted with bar-shaped marks of white; primaries, inner webs of secondaries and tertials, primary-coverts, and point of wing blackish brown; a series of bar-shaped spots on the inner webs of all the quills and corresponding marginal whitish spots on the outer webs of the primaries; secondary-coverts with terminal reddish-white spots;

BRACHYPTERNUS CEYLONUS.

beneath, in continuation of the throat, the feathers of the chest have white centres and broad black margins, which latter coalesce lower down into bars, most conspicuously on the flanks and under tail-coverts; under tail- and under wing-coverts black, barred with white.

Female. Has the forehead and crown black, with terminal, circular, white spots, the occiput and nuchal crest being crimson.

Young. Birds of the year have the iris brown; bill dark horn-colour, light bluish at the base beneath, and varying in length from 1·2 to 1·5 inch (tip to gape).

The forehead and crown in both sexes are black; the *male* has the feathers on the latter part faintly tipped with reddish, which colour seems to spread to the frontal feathers at the end of the first year, and probably by moult; the *female* has the forehead and front of crown unmarked at first, and the white-spotted feathers appear by moult at the age of about four months; the face and throat are less spotted than the adult, the white markings being roundish and small; on the chest there is much more black, the white spaces being broken in the centre by the black of the outer portions of the feather, while on the breast the black margins are broader and extend to the tip of the webs; the pale terminal spots on the wing-coverts are absent or very faintly indicated.

With age the markings of the chest open out into broad white mesial stripes.

Obs. This species is not very distantly related to the next, bearing, as Blyth remarks, the same relationship to it as *Chrysocolaptes stricklandi* does to the South-Indian *Ch. delesserti*. In the dark race of *B. puncticollis*, as found in the forests of Ceylon, there is a still greater approach to the present species, for the well-matured male of it is almost as red on the back.

Distribution.—This Woodpecker is the most abundant species of its family in the island, and being such a common bird was known to the old naturalist Forster.

It is diffused throughout the entire island, with perhaps the exception of the extreme north of the Vanni and the Jaffna peninsula. It is abundant in the Western and Southern Provinces, and equally so in the forest-clad country lying to the south of the Haputale hills, in the interior of the Eastern Province, and scarcely less so in the jungles between Matale and Trincomalie and in the N.W. Province. Mr. Holdsworth did not observe it in the Aripu district, nor did I meet with it there nor in the island of Manaar; some distance inland from Mantotte it is, I am informed, not uncommon, as also further north in the Vavonia Valankulam district. In the Kandyan Province it is not rare in the Knuckles district, in Pusselawa, Nilambe, Hewahette, Dimbulla, and Uva, being perhaps most numerous in the latter part. In his 'Prodromus,' Dr. Kelaart records it as very abundant at Nuwara Elliya; but this remark, doubtless, really refers to Layard's Woodpecker, which might easily be mistaken, by an unpractised eye, for the present species. I have never seen it above 3500 or 4000 feet; but there is no reason why it should not range higher than that elevation. It is found likewise in the hills of the Southern Province, for it is not uncommon above Morowaka and in other localities in the Rakwana district.

I did not notice it in the scrubby districts along the south-eastern seaboard, not meeting with it nearer the coast than about 10 or 15 miles north of Hambantota; not so, however, on the western coast, where it frequents the cocoanut-plantations close to the sea-beach, being the first Woodpecker which the newly arrived collector meets with in his trips to Mount Lavinia or through the cinnamon-gardens to the villages about Kotté.

Habits.—Partial as the Ceylon Woodpecker is to cocoanut-groves and compounds containing jack, bread-fruit, and other cultivated trees, it is nevertheless found, in the wilder districts, in forest and jungle of all sorts. It is a fearless bird and very active, running up and round the stems of trees, searching flowers and nut-stalks at the heads of palms, and in a general way perpetually cramming itself with its favourite food, red ants (*Formica smaragdina*). Its usual note is the loud harsh call well known to most people in Ceylon, besides which it delivers a loud "trill" while searching for food; and on many occasions I have observed a pair working about the roots of large trees in the forest going through a little parlance or conversation quite unlike the common notes. Its manners while feeding are quaint, striking loud blows and twisting its head attentively on one side with a view of finding out the whereabouts of its intended victim. It is also highly

interesting to a lover of nature to witness a pair of these birds carrying on their courtship, as they jerk to and fro, round and up a bare cocoanut-trunk, hammering and alternately cocking their heads on one side to listen, then feeding each other, and playing hide and seek round the bare stem, uttering the whole time a low love-chattering. The rattle which this Woodpecker performs when sounding a hollow branch for insects is quite as rapid as that of Layard's Woodpecker, but not so powerful. I have observed it sound a branch many times, twisting its head into a listening attitude after each series of strokes before it gave up the task as unsuccessful. Its harsh call above mentioned is uttered while the bird is in flight, which is, as Layard mentions, sustained "by short rapid jerks repeated at considerable intervals."

This species is very fond of searching about the flowers of the cocoanut-palm, which abound in various insects on which it feeds; and this habit has caused the natives to think that it resorts to the tops of the cocoanuts for the purpose of feeding on the toddy!

Perhaps the most remarkable feature in this bird's economy is its extraordinary pugnacity. As mentioned in the preceding article, it is addicted to fighting with the Black-backed Woodpecker, disputing with it the right of entrance into the holes which the latter has perhaps excavated for its nest. It is, however, not less amiable towards its own kin! Mr. Parker writes me an account of a combat which he witnessed once, and comments on the disposition of the bird as follows:—"I think the Red Woodpecker is one of the most fearless (amongst his fellows) of any bird I have seen. One day, when examining a tank, I heard a tremendous screaming in a large tree, and I found there two Red Woodpeckers fixed *vertically* on opposite sides of a small *horizontal* branch hammering away at each other as they would do at a dead tree. They were far too busily engaged to take any notice of me, and after watching them for 10 minutes or a quarter of an hour I left them still screaming and fighting." I have observed that they do not live on very good terms with the Racket-tailed Drongo, *Dissemurus malabaricus*; but in this case it is the latter that I have always noticed to be the aggressor, flying at and driving the Woodpeckers from the trees in which they, the Drongos, may be sitting.

The skin of the Red Woodpecker is tough and very thick, but not so much so as that of either of the foregoing *Chrysocolaptæ*; its neck is thicker in proportion to the head than in those birds.

Nidification.—In the south of Ceylon the Red Woodpecker breeds from February until June, and not unfrequently nests in the trunk of a dead cocoanut-tree, cutting a round entrance and excavating the decaying part of the tree for some distance below it. I have never been able to procure the eggs, although the bird is so common.

The figures in the Plate accompanying this article represent a male and female of this Woodpecker.

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BRACHYPTERNUS PUNCTICOLLIS.

BRACHYPTERNUS PUNCTICOLLIS.

(THE SOUTHERN GOLDEN-BACKED WOODPECKER.)

Brachypternopicus puncticollis, Malh. Rev. Zool. 1845, p. 404 (♂ adult).
Picus chrysonotus, Malh. Rev. Zool. 1845, p. 404 (♀).
Brachypternus micropus, Blyth, J. A. S. B. 1845, xiv. p. 194.
Brachypternus aurantius, Kelaart, Prodromus, Cat. p. 128 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 448.
Brahmapicus puncticolli, Malh. Mon. Picidæ, vol. ii. p. 92, pl. 70 (1–4), 1861.
Brachypternus chrysonotus, Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 656 (1856); Jerdon (*nec* Lesson), B. of Ind. p. 296 (1862).
Brachypternus puncticollis, Holdsworth, P. Z. S. 1872, p. 428; Hume, Str. Feath. 1876, p. 457; Fairbank, ibid. 1877, p. 396.
Brachypternus intermedius, Legge, Str. Feath. 1876, p. 242; Whyte, ibid. 1877, p. 201.
Yellow-backed Woodpecker, Europeans in Jaffna district.
Pastru carpentaru, lit. "Carpenter-bird," Portuguese in Ceylon.
Tatchan-kuruvi, Ceylonese Tamils; *Kæralla*, Sinhalese.

Adult male. Length 10·3 to 10·75 inches; wing 5·3 to 5·5; tail 3·5; tarsus 0·8; outer anterior toe 0·8, claws (straight) 0·45; posterior outer toe 0·7; bill to gape 1·4 to 1·55.

Adult female. Wing 5·1 to 5·35 inches.

Male. Iris red; bill blackish or very dark plumbeous, edges of upper mandible paler; legs and feet dull sap-greenish, claws blackish leaden.

Red race.—*Male.* Occiput and crest pale crimson, the feathers black at the base and with a narrow pale stripe down the centres; forehead and crown black, each feather "pointed" with crimson; a white streak passing from the nostril under the eye and expanding on the sides of the neck, where it meets another passing from above the eye and over the ear-coverts; the latter white, edged with black; lower back, tail, primaries and their coverts, and the inner webs of the secondaries black; interscapular region, middle of the back, scapulars, and adjoining greater wing-coverts orange-yellow on the centres of the feathers, crimson at the tips, and olivaceous yellowish at the bases; the extent to which the dorsal and scapular feathers are terminated with crimson varies much; outer webs of secondaries and tertials dusky orange; some of the outer median wing-coverts with a whitish central spot near the tips; quills barred with white, the secondaries on their inner webs, and the primaries, all but the first, on both; the latter feathers with one white spot on the inner web; chin, throat, lower part of cheeks, and fore neck black; the feathers of the chin and throat with a terminal triangular white spot and a bar of the same across the bases; the feathers of the fore neck with only the terminal spot; chest, breast, and flanks white, with broad, lateral, black margins, decreasing in width towards the abdomen; lower flanks barred with black; under tail-coverts barred and tipped with the same; under wing-coverts and edge of the wing white, the feathers margined with black.

The extent to which the crimson coloration is developed in some birds from the forests is shown in the figure in the Plate; in this the back and scapulars are almost entirely crimson, with a yellowish hue about the centres of the feathers, the latter colour being almost entirely overcome by the red; the outer webs of the secondaries, the tertials, and the wing-coverts are reddish orange, with a yellowish hue slightly developed near the shafts; the outer wing-coverts are somewhat tinged with yellow.

Female. Iris duller than the male. Forehead and crown black, the feathers with terminal spots of white. The crimson of the occiput not so bright; the back and scapulars orange, or in some yellowish orange tipped with crimson. Some have the back uniformly orange, while others have the feathers yellow and the red coloration confined to the tips; but in all cases there is less of the latter hue than in the males.

Pale or yellow race.—*Male.* Markings the same; the white wing-covert spots larger and continued more on the inner feathers; the ear-coverts with less black; the back and scapulars golden yellow; outer webs of secondaries, tertials, and the secondary wing-coverts dusky golden.

In one specimen from the Jaffna district, which presents an abnormal development of white in the spots of the primaries and those on the wing-coverts, the terminal spot on the feathers of the throat is connected with the basal bar by a mesial stripe, and this imparts the appearance of a specimen of *Brachypternus aurantius.*

Female. Does not differ from the male in the yellow coloration, the head and forehead being, as in the other race, black with white spots.

The older the bird in both sexes the greater the amount of white on the breast and chest, the white portions having evenly defined lateral edges and not indented with the marginal black as in birds not thoroughly mature.

Young. A female in nest-plumage has the dark portions brownish black instead of jet-black; the feathers of the forehead and crown with faint fulvous-white tips; the spots on the throat and fore neck very small, the basal marking in the form of a spot and not of a bar; the white central portions of the chest-feathers small and round in form, the black portions deeper than in the adult and extending to the tips as well as the margins.

Obs. The light form of this species resident on the coast is evidently the bird referred to by Layard as *B. aurantius*, which is a North-Indian Woodpecker, and not found in Ceylon, although it must be remarked that specimens are rarely found among our Jaffna birds with an extraordinary development of the white on the throat-feathers, which nearly approach individuals of typical *B. aurantius*; their isolation, however, precludes their being considered any thing but abnormally-marked examples of this truly puzzling species. The present species is, in fact, one of the most difficult birds to deal with in the whole of this work. Its extreme variability of coloration, apparently dependent on the effect of climate and situation, and its somewhat doubtful connexion with its relations of South India (*Brach. puncticollis* of Malherbe), together with a want of access on my part to a good series of Indian specimens carefully recorded from the *forests* and open low-lying districts analogous to the north coast of Ceylon, make it almost impossible for me to come to a satisfactory conclusion in the matter. First, as to variability of coloration: Ceylonese specimens from the Jaffna peninsula and adjacent coast, as far south as Manaar, exhibit no variation in the pale golden hue of the back, which resembles that of *B. aurantius*; in the island of Ramisserum, however, which belongs to the mainland, we at once get a richer yellow-backed bird than the Jaffna and Manaar one, and some examples even have a faint tipping of crimson to the feathers of the back, whereas in some specimens from South India the whole coloration of the upper surface has a dull orange hue, a similar example to which I once shot near Trincomalie, forming a good link between the Jaffna and the forest bird. One such specimen from "Malabar," in the British Museum, has the wing 5·9 inches; it is a female, and the largest specimen I have ever seen.

Directly we enter the forests in Ceylon, we find the back and scapulars of an orange-yellow instead of a golden yellow, and the tips more or less "touched" with crimson, or the whole back of a uniform reddish-orange hue. Examples from Madras, and presumably from the forests, have much less of the crimson tippings than is exemplified in some from Ceylon, males from the former locality corresponding with females from the latter. Malherbe's description of these birds from the Nilghiris is very exact. He says, "Le dos et les tectrices alaires sont d'un jaune-orange lavé de *rouge vif*: les plumes de ces parties sont olivâtres à leur bases, puis lavées de jaune-orange et terminées d'un rouge à reflets qui borde aussi la moitié de la plume." Blyth, in describing his *B. micropus*, which seems to me to have been an example of a *pale-backed* bird of this species, speaks of the black of the nape being continued lower upon the shoulders, and considerably contracting "the golden orange of the back." The expression *golden orange* seems to imply a uniformity of coloration, as would have been the case with a pale-backed individual. It is evident, from what I have adduced here, that this Woodpecker varies immensely in India in its coloration, but not so much, I am inclined to think, as in Ceylon. The extremely red bird was first of all considered by me to be distinct, and was named (*loc. cit.*) *B. intermedius*; but as I now find, from an examination of a more complete series, that there is every grade from the pale yellow to it, and having never seen another so dark, it becomes necessary to unite the two extremes. Rather, perhaps, does the pale golden bird need separation; for I question whether any specimens from India can compare, in this respect, to the Ceylonese coast race. The area of country which it inhabits is, I think, too small to allow of *its* being elevated into a race or subspecies; but if, when further investigation is brought to bear on the matter, it be found to be paler than any Indian examples, the entire Ceylonese group of Golden-backed Woodpeckers might well be separated as *B. intermedius.* It is just possible that the very dark bird which I figure here may be a hybrid between *B. ceylonus* and the present species.

As touching the synonymy of this Woodpecker, Malherbe's name seems always to have been considered to have priority over Blyth's, owing probably to the November number of the 'Revue Zoologique' having been published earlier

than the July number of the 'Journal of the Asiatic Society of Bengal'; otherwise *B. micropus* is the older of the two names. The *Picus chrysonotus* of Lesson never referred to this species; it was simply the female of *B. aurantius*; for, remarks Malherbe, the southern bird did not exist in the Paris collection at the time Lesson gave his name.

Distribution.—The pale race of this Woodpecker inhabits the Jaffna peninsula and the adjacent coast down to Manaar; further south it occurs, but less plentifully, to Puttalam, although specimens appear to be generally tinged with orange in the latter district; on the east coast it is found as far south as Trincomalie, but is not at all common on that side of the island. I have noticed a golden-backed Woodpecker south of Kottiar Bay, but I am not able to say to which race it belonged. In the forests the orange bird is found throughout the northern half of the island. I have procured it a few miles inland from Trincomalie; it is common at Anaradjapura, and throughout the Seven Korales down to the Puttalam district, where Mr. Parker has seen it in the jungles near Uswewa. I fully expected to find it in the jungles of the Eastern Province, but did not succeed, although I was shown a specimen by the late Dr. Gould which he had procured in the "Park" country while on a trip to that part of Ceylon.

I think I may safely say that directly this species enters the shady forests of Ceylon it alters its coloration, assuming the orange hue; no pale-backed bird has ever, to my knowledge, been shot in the interior, and no orange-backed one at Jaffna.

In Ramisserum Island the Southern Golden-backed Woodpecker appears to be very common. My native collector brought me a series of specimens from it, and said it was abundant there. Jerdon says that it is found in "various parts of Southern India, in the Carnatic, and in Malabar." From the latter district I have seen skins; and Mr. Fairbank writes that it is common in heavy forest on the lower Palanis; he has also met with it so far north as in the Khandala district near the Goa frontier.

Habits.—This handsome species frequents, on the sea-coast and in the maritime districts, cocoanut- and palmyra-groves, native gardens, compounds, and scattered jungle in the vicinity of the forest, while in the interior it is found throughout the forests, affecting the heaviest timber and the densest jungle. It has the same jerky flight and a similar loud note of alarm to the last species, and usually consorts in pairs, which do not keep close company, but generally follow each other about, sometimes working on the same tree, but more often searching for their food at a little distance from one another. It runs actively up the trunks of the cocoanut-trees, and when it has reached the top disappears into the head and searches about among the roots of the fronds and the dead flower-stocks, where there are generally numbers of ants to be found. It is very early astir, and when the day has scarcely dawned its loud note is to be heard among the cocoanut-groves in the Jaffna district. It is then very restless, flying from tree to tree before finding a suitable quantity of ants to attack; and a considerable time elapses before it settles down steadily to work, vigorously tapping and listening attentively for the result of its morning salutation to the varied insect inhabitants of the fine old tamarind- or jack-tree into which it has perhaps betaken itself. In the forests I have seen it devoting much attention to the huge bosses and knarled excrescences of the fine Koombook- or Mee-trees which one so often finds near the remote village tanks. It has a trill note, somewhat louder than that of Layard's Woodpecker.

Nidification.—I know nothing concerning the nesting of this Woodpecker; but Layard says that it excavates large holes in the male palmyra-trees, the wood of which is softer than that of the female.

The red-backed figure in the Plate represents the type specimen of my *B. intermedius*, described *loc. cit.*, and which was presented to the Colombo Museum by the late Governor of Ceylon, Sir Wm. Gregory. The pale bird is from the Jaffna peninsula, and the female in the background is an orange-backed bird from the forests near Trincomalie.

PICARIÆ.

Fam. CAPITONIDÆ.

Bill large, wide at the base, conic, inflated at the sides, the margins toothed in some; the culmen curved, the base of the upper mandible continued backwards to the gape; the tips of both mandibles acute; base of the bill furnished with bristles. Tail short and soft, of ten feathers. Feet zygodactyle. Sternum with the keel low and the posterior edge with two emarginations on each side.

Subfam. MEGALÆMINÆ.

Bill with the margin of the upper mandible smooth, variable in length; shorter than the head in some, longer in others.

Genus MEGALÆMA.

Bill conical, stout, wide at base, compressed towards tip; upper mandible overlapping the under at the gape, which is wide; culmen more or less arched. Nostrils exposed and in a basal groove parallel to the culmen, protected by long bristles pointing forwards. Lores, gape, and chin furnished with similar tufts. Wings short, the tertials comparatively long; 1st quill short, 4th and 5th subequal and longest. Tarsus longer than the long anterior toe, scutellated before and behind. Feet zygodactyle, with stout scales; the anterior toes syndactyle.

MEGALÆMA ZEYLANICA.

(THE BROWN-HEADED BARBET.)

(Peculiar to Ceylon.)

Bucco zeylanicus, Gm. Syst. Nat. i. p. 408 (1788).

Capito zeilanicus, Vieill. N. Dict. d'Hist. Nat. iv. p. 499 (1816).

Bucco zeilanicus, Cuv. Règne An. p. 457 (1829); Blyth, J. A. S. B. xv. 1846, pp. 13, 282; Hartlaub, Rev. Zool. 1841, p. 337.

Megalaima caniceps, G. R. Gray, Gen. Birds, ii. p. 429 (1846); Blyth, Cat. B. Mus. A. S. B. p. 66, 1849 (in part), et J. A. S. B. 1851, xx. p. 181 (in part); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 446; Cassin, Orn. Rep. U.S. Exp. Japan, p. 242.

Bucco kottorea, Hartlaub, Rev. Zool. 1841, p. 337.

Bucco viridis, Bonap. Consp. Av. i. p. 144 (1850).

Megalaima zeylanica, Blyth, J. A. S. B. 1851, xx. p. 181; Kelaart, Prodromus, Cat. p. 127 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 46; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 638 (1856); Jerdon, B. of Ind. i. p. 311 (1862); G. R. Gray, Cat. B. Brit. Mus. *Capitonidæ*, p. 13 (1868); Holdsworth, P. Z. S. 1872, p. 429; Legge, Ibis, 1874, p. 15.

J.G.Keulemans lith

Hanhart imp

MEGALÆMA ZEYLANICA.
MEGALÆMA FLAVIFRONS

Megalæma zeylanica, Blyth, Ibis, 1867, pp. 297, 311; Marshall, Mon. Capitonidæ, pl. 40 (1871).

Le Kottorea, Levaill. Barbus, pl. 38; *Le Cabezon kottorea*, Vieill. N. Dict. d'Hist. Nat.

The Large Barbet, Kelaart; *Woodpecker*, Europeans in Ceylon.

Kotoruwa (so called from its note), Sinhalese; *Kootoor*, Ceylonese Tamils; *Kootooroo*, Portuguese in Ceylon.

Similis *M. canicipiti*, sed minor et capite et collo postico brunnescentioribus, et striis medianis minùs conspicuis: tectricum alarum maculis pallidis minùs conspicuis.

Adult male and female. Length 9·5 to 10·0 inches; wing 4·2 to 4·5; tail 2·5 to 2·7; tarsus 1·2; outer anterior toe and claw 1·15; posterior outer toe 1·1; bill to gape 1·6 to 1·8.

Iris reddish brown, with a pale outer circle, sometimes brownish buff; bill dull orange or fleshy red; legs and feet sickly yellow or pale olivaceous yellow; orbital skin dull yellow.

Bristles round the bill black; head, hind neck, throat, and chest umber-brown, passing on the lower part of hind neck into the grass-green of the back, wings, and tail; the brown parts with pale striæ, yellowish and most conspicuous on the lower part of hind neck, throat, and chest; wing-coverts with yellowish terminal spots; some of the tertials and rump-feathers with an occasional wash of bluish; outer primaries brown, with yellowish-grey edgings towards the tips: inner webs of remaining quills brown, with pale yellowish inner margins; chin obscure slaty grey (this hue not always discernible); ear-coverts brownish yellow; beneath, from the chest, light green, paling gradually into the brown of that part; under wing-coverts yellowish, tinged with greenish; under surface of tail bluish.

Young. The young quickly assume the plumage of the adult, being at first paler about the head and hind neck.

A young female, with the wing measuring 4·1 inches, in my collection, has the head, face, and hind neck pale brown, with the striæ whitish, in which colour they are continued to the green feathers of the interscapular region; the throat and fore neck are paler brown than the head, with the striæ whitish and blending gradually into the ground-colour; upper breast very slightly suffused with green. This example might well pass for a small specimen of *M. caniceps*.

Obs. This species is very closely allied to its representative in Central and Southern India, some specimens being scarcely separable were it not for their constantly smaller size. The wing in this Barbet, *Megalæma caniceps*, varies from 4·6 to 4·9 inches, the average length being, I imagine, about 4·75. It has the head, hind neck, and throat paler than in *M. zeylanica*, the stripes are broader and are continued down on to the interscapular region; the wing-coverts have the pale central spots more pronounced.

Megalæma viridis, from Malabar, Travancore, and other Southern-Indian hill-districts, is very nearly related to the last mentioned, but is smaller than it and less even than the Ceylonese bird. The wing varies from 3·7 to 4·4 inches. Jerdon's description of it is:—"Very similar to *Meg. caniceps*, but smaller, the brown of the head and nape scarcely lineated; that of the under parts pale, becoming whitish on the throat; there are no pale specks on the wing-coverts, nor any traces of pale streaks on the green of the back." Another species from Southern India is the *Megalæma inornata*, Walden, which was, until lately, confounded with *M. caniceps*. It is readily distinguished from that species by the "absence of the broad pale median streaks on the pectoral plumage." It has the "chin, throat, breast, and upper portion of the abdominal region uniform pale brown; each feather has the shaft very faintly paler. The plumage above closely resembles that of *M. caniceps*; but the terminal spots on the wing-coverts and tertiaries are almost altogether wanting." In the uniformity of the throat it differs from all other Barbets.

Distribution.—This noisy well-known bird, commonly called a "Woodpecker" or "Woodcutter" by the Eurasian population and many Europeans, is very abundant in most parts of the low country, except close to the seashore or in large tracts of damp forest such as clothe much of the face of the southern half of the island. It is likewise an inhabitant of the Kandyan Province up to an altitude of about 2500 or 3000 feet in the western and northern parts, and to about 4000 feet in the drier district of Uva. Those parts in which it is numerous are the cultivated portions of the west and south-west, parts of the Eastern Province (in which it is locally distributed), portions of the flat forest-clad country lying between Lemastota and the S.E. coast,

and the north-east of the island. It is found in the Vanni and throughout most of the country lying immediately to the north of Dambulla, wherever the jungle is of an open character. In the Seven Korales the same may be said of it; and Mr. Parker writes me that it is common about Uswewa. Mr. Holdsworth does not record it from Aripu; but it avoids such dry scrubby districts on the seaboard, being similarly absent from the brushy country about Hambantota.

As regards the Central Province it is not uncommon in Dumbara and in the valleys of Hewahette, Maturata, and other basins of the hill-tributaries of the Mahawelliganga. In the glens or steep ravines intersecting the great expanse of hilly patnas between Fort MacDonald and Haputale it is likewise found, and is now and then seen at a considerable altitude on the pass leading up to Hakgala. Near Banderawella I have met with it at about 4000 feet elevation.

Habits.—The Brown-headed Barbet inhabits compounds, open wooded country, dry jungle, and scanty forest where fruit-bearing trees are plentiful, on the seeds of which it principally feeds.

There is perhaps no bird better known than this one is to sportsmen or any others who are induced to visit or reside in the cultivated interior of the Western and Southern districts; taking up their abode in some shady compound encircling the native cultivator's house on the nearest rise to his ancestral paddy-fields, these noisy birds commence early in the morning to call to one another, and make the woods resound with their guttural cries. Its loud scale-notes, commencing in measured time and increasing in rapidity and loudness, must be known to every European in the low country, and give rise to its native name of *Kotoruwa*, which has a slight resemblance to some of the syllables in the scale; they much remind one of the commencement of the laugh of the Great Brown Kingfisher, or "Laughing Jackass," of Australia. The food of this Barbet consists of every sort of tree-fruit, seed, and berry; nothing seems to come amiss to it, for there is no tree that bears fruit that it may not sometimes be found in. It is not as gregarious as the next, or as the two smaller Barbets, but, on the contrary, is unsociably inclined towards its fellows, and more than two or three are seldom found in the same tree. It is active in its movements, seizing fruit that may be firmly attached to the stalk, and swinging its body from its perch, wrenches off the coveted morsel; fruit and berries are swallowed whole, and in the north the favourite food is the berry of the banyan or the luscious seed of the Palu or iron-wood tree, of which the Ceylon bear (*Prochilus labiatus*) is so fond. It perches with the body inclining to the horizontal and the head thrust forward in an attitude of watchfulness, unlike the smaller Barbets, who sit bolt upright and twist the head stupidly from side to side. Coleopterous insects are likewise devoured by it; and in captivity this Barbet has been known to exhibit, as some Toucans do, a carnivorous tendency. An interesting account of a caged bird is contained in Layard's "Notes on the Ornithology of Ceylon." At page 447, Ann. & Mag. Nat. Hist. 1854, he writes:—"One kept in a large aviary in Colombo destroyed all the little Amadinæ placed with it. Not content with snapping them up when within his reach, he would lie in wait for them behind a thick bush or the feeding-trough, pounce upon them unawares, and after beating them a little on the ground or perch, swallow them whole. When this cannibal came into my possession he was confined in a smaller cage than that in which he had at first been secured; this seemed to displease him, and he went to work to find some means of escape; he narrowly examined every side and corner to discover a weak spot, and having detected one, applied himself vigorously to bore a hole through it, as a Woodpecker would have done; grasping the bars with his feet, he swung himself round, bringing his whole weight to bear upon his bill, which he used as a pickaxe, till the house resounded with his rapid and well-aimed blows. On being checked from exercising his ingenuity in this manner, he became sulky and refused to eat or offer his call of recognition when I approached him; in a day or two, however, he apparently thought better of the matter, resumed his labours upon another spot, and fed as voraciously as ever, devouring huge slices of bananas, jungle fruits, the bodies of any small birds I skinned, &c. I hoped he would have lived long with me, but found him dead one morning; and as he was fat and well-favoured, I presume he died a victim to the solitary system."

The flight of the *Kotoruwa* is performed with quick beating of the wings, and is somewhat laboured, though by no means slow, owing to the amount of momentum which such a solid frame must naturally acquire.

Nidification.—This bird breeds from March until July. The latter month is rather late, I imagine;

but at that date I found a nest with four young ones near Minery. It hollows out with its powerful bill a hole in a rotten tree just large enough to allow of its entering the egg-cavity, which is some distance down the trunk or branch. It does not use the same nest twice, but having found a tree with wood suited to its work, perforates it each year for the new nest, as many as 8 or 10 holes being sometimes visible in a tree by a jungle roadside. It is only when sounding wood before making its nest that these birds tap with their bills, the blows being very slowly repeated with perhaps an interval of 10 seconds between each. There are generally a few bents and grass-stalks collected for the eggs to lie on, but scarcely worthy of the name of nest. The eggs are three or four in number, pure white, glossy, and rather round in shape; they measure about 1·1 by 0·9 inch.

The upper figure in the Plate accompanying this article represents a male of this species from the Western Province.

MEGALÆMA FLAVIFRONS.

(THE YELLOW-FRONTED BARBET.)

(Peculiar to Ceylon.)

Bucco flavifrons, Cuv. Règ. An. i. p. 428 (1817).

Bucco aurifrons, Temm. Pl. Col. texte (1831).

Megalæma flavifrons, Bonap. Consp. Gen. Av. i. p. 143 (1850); Blyth, J. A. S. B. 1852, p. 179, et Ibis, 1866, p. 227; Gray, Cat. B. Brit. Mus. *Capit.* p. 8 (1868); Marshall, Monog. Capit. pl. 30 (1871).

Megalaima flavifrons, Kelaart, Prodromus, Cat. p. 127 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 447; Holdsworth, P. Z. S. 1872, p. 429; Layard, P. Z. S. 1873, p. 204; Legge, Str. Feath. 1875, p. 365.

Cyanops flavifrons, Jerdon, B. of Ind. i. p. 314 (1862); Blyth, Ibis, 1867, p. 297; Legge, Ibis, 1874, p. 15.

Le Barbut à front d'or, Levaill. Barbus, pl. 35; *The Yellow-headed Barbet*, Kelaart; *The "Shouter,"* Europeans in planting districts.

Kotoruwa, Sinhalese.

♂ *ad.* suprà prasinus, interscapulio obscuriùs viridi, occipitis nuchæ et colli postici plumis clarè flavo medialiter striatis: remigibus nigris, extùs prasinis, intùs flavo marginatis: caudâ prasinâ: fronte et vertice aurato-flavis: loris, fasciâ superciliari, facie laterali, gulâque totâ cyaneis: genis anticis aurato-flavis, fasciam mystacalem parvam formantibus: corpore reliquo subtùs pallidè viridi, juguli et pectoris plumis prasino marginatis: subalaribus pallidè ochrascenti-fulvis, obscurè viridi lavatis: rostro viridescenti-corneo, mandibulâ pallidiore: pedibus pallidè viridescentibus: iride dilutè rubra.

♀ mari similis.

Adult male and female. Length 8·3 to 8·9 inches; wing 3·45 to 3·7; tail 2·2 to 2·3; tarsus 0·9 to 1·0; outer anterior toe and claw 0·95 to 1·05; outer posterior toe 0·85; bill to gape 1·15 to 1·3; height at front of nostril 0·32 to 0·4. *Females* average slightly smaller than males, and the bills of both sexes vary in size.

In this species the bristles at the gape and chin are slight, and the lores more feathered than in the preceding.

Iris light red, or pale brownish red, a pale outer circle often present; bill greenish horn, slightly dusky at base of culmen, lower mandible paler; tarsi and feet sickly green, the tarsi in some bluish; soles yellow, claws dusky.

Lores, a superciliary stripe, cheeks, ear-coverts, and throat pale verditer-blue, lightest on the latter part; a spot beneath the gape, forehead, and front of crown amber-yellow, passing on the head into brownish green, and from that into the grass-green of the back, wings, and tail; nape, sides, and back of neck marked with light striæ, yellowish on the former, and greenish white on the neck; outer primaries and inner webs of quills brown, margined internally with yellowish; longer primaries outwardly edged light towards the tips; beneath pale green; bases of abdominal feathers whitish; chest and sides of breast with crescentic margins of brownish green.

Obs. The coloration of this Barbet is peculiar, inasmuch as it forms a link between the *Cyanops* group and that comprised of the members of the genus *Megalæma*. Although now classed with the latter, it has, as I have pointed out above, a slight dissimilarity in the less amount of facial bristling and more feathered lores, besides which its bill is shorter in proportion to its width at the base. Some variation in its plumage is observable; the extent of the frontal yellow varies, in some specimens it ceases abruptly, while in others it passes back almost to the occiput. The striæ on the hind neck are sometimes broad and almost white in colour, individuals so marked having the lunulations on the chest very pale; this is, perhaps, a sign of immaturity. There is no difference in size between low-country and hill birds, some Mahara specimens in my collection being as large as, if not larger than, any others.

Distribution.—This Barbet has long been known as a peculiar Ceylon bird. Levaillant described it in his great work among the Barbets, from a specimen in the Paris Museum, and Cuvier afterwards gave it its Latin title of *flavifrons*. Its head-quarters in Ceylon are the hills of the Kandyan Province and those of the southern group lying in the Kolonna, Morowak, and Kukkul Korales, downwards from all of which it spreads into the low country and has there a somewhat peculiar distribution. It is very abundant throughout all the Kandyan Province, ranging up to the forest of the main range, but not nearly in such numbers as it inhabits the coffee-districts. I have met with it as high as the Kandapolla woods, 6400 feet, but not at Nuwara Elliya or on the Horton Plains, although it is found just beneath the latter, at the foot of the "World's End" precipice. In the coffee-districts of Rakwana and the Morowak Korale it is numerous, but it is far more abundant in the Singha-Raja forests of the Kukkul Korale. As regards its dispersion through the low country, commencing in the south, we find it in the Opaté, Oodogamma, and other fine timber-forests on the banks of the Gindurah, and in the dry season in the forest of Kottowe, near Galle. In the forest-region of the south-east I never met with it. In the Western Province it is common in some localities in Saffragam, and is numerous in parts of the Pasdun Korale, whither it finds its way down from Kukkul Korale. It inhabits the hills stretching from Ambepussa to Avisawella, and thence spreads down the river to Kaduwella, and northwards to Mahara and Heneratgoda; in the south-west of the Raygam Korale it is not uncommon, and is numerous about Kæsbawa and other places in the Hewagam Korale. It extends from the Ambokka range into the Seven Korales, in which I have found it on the western slopes of the Doolookanda hill; but further out than this I was unable to trace it. I do not think it ranges much to the north of Dambulla, or I should most likely have met with it on the slopes of the isolated mountain of Rittagalla. In the Eastern Province its distribution is equally local; for it is met with in some forests near Kumberuwella, about 25 miles from Batticaloa, and also in the Friars-Hood forests, but thence through a wide expanse of forest-country to the foot of the Madulsima range it does not appear to be found.

I observe that Layard (P. Z. S. 1873) is of opinion that it did not frequent the low country of the Western Province in his day, but that it has spread outwards of late years. I think, however, the above "distribution" will demonstrate to any one knowing the interior of Ceylon that its range is very peculiar, some districts coming in for a share of its patronage, while others adjacent to them are altogether passed over.

Habits.—The voice of this bird is one of the chief ornithological characteristics of the Ceylon hills; the notes which constitute it have somewhat the character of those of the larger bird, but differ chiefly in the "roll" with which they begin; they are commenced early in the morning, and continued for many hours, until the persistent Barbet, judging by the tone of his cries, becomes hoarse, and then there is a cessation, much to the relief of the wearied planter over whose bungalow the "shouter" has perhaps been calling to his mates away up at the forest's margin for the past hour! Mr. Bligh tells me that he observes a very perceptible decrease in this bird's loquacity as soon as it has begun to breed, although it has, of course, been more than usually noisy during the season of courtship. It delights in perching on the top of a tree growing at the brink of some dizzy precipice, from which its note swells far and wide over the beautiful coffee-planted gorge beneath; but still more curious is the manner in which the monosyllabic sound *quiōk, quiōk,* ascends audibly from the edge of the patnas far beneath the bungalow, and falls on the ear as distinctly as if it were issuing from a tree close at hand. In the low country it is found chiefly in forest, but sometimes about paddy-field woods, as at Mahara, Kaduwella, Ambepussa, and other places; in the timber-jungles of the south-west it is next to impossible to procure, as it keeps to the tops of the highest Hora- or Keena-trees, and would never be discovered were it not for its perpetual shouting. It is a gluttonous feeder, collecting in dozens among the branches of any tree in fruit, climbing intently about and wrenching off the berries with its powerful bill, at the same time letting much fall to the ground. In the Singha-Raja forest I found it feeding greedily on the berry of the Dang-tree (*Syzygium caryophyllæum*). Towards evening, after digesting its morning food, the Yellow-fronted Barbet begins its clamour again, and after feeding becomes silent before dusk. It is noticeable to what a great extent these birds answer one another; as soon as one commences its note, the refrain is taken up by another not far distant, and then by a third, and so on until the whole wood resounds with the not unmelodious but rather wearying sounds. I have not unfrequently heard from my friends in the coffee-districts that the continuous cry of this bird near the bungalow of a sick person has a most wearisome effect.

Nidification.—This Barbet has apparently two broods in the year, for the season of its breeding lasts from February until September. It selects usually a soft-wood tree, such as the cotton (*Bombax malabaricum*), and cuts a round hole into the heart of the branch or trunk, in which it excavates a cavity for its eggs some distance down from the entrance. The eggs are two or three in number, and are laid on the bare wood; they are pure white, rounded in form, with a smooth texture; they average 1·11 by 0·81 inch. When the trunk of a tree is chosen, several holes are sometimes commenced before a soft-enough place is found to excavate the nest.

The lower figure in the Plate accompanying the preceding article represents a fine specimen of this bird from the Southern Province.

Hanhart imp
10

XANTHOLÆMA RUBRICAPILLA
juv LORICULUS INDICUS

Genus XANTHOLÆMA.

Bill shorter and wider at the base than in *Megalæma*; culmen more arched; loral bristles very long. Wings with the 2nd quill the longest, the 3rd only slightly less than it. Legs and feet as in the last genus.

XANTHOLÆMA RUBRICAPILLA.

(THE LITTLE CEYLON BARBET*.)

(Peculiar to Ceylon.)

Bucco rubricapillus, Gm. Syst. Nat. i. p. 408 (1788); Blyth, J. A. S. B. 1847, pp. 386, 464.

Bucco lathami, Gm. Syst. Nat. i. p. 408 (1788); Lath. Ind. Orn. i. p. 205 (1790); Cuv. Règ. An. i. p. 45 (1829).

Capito rubricapillus, Vieill. N. Dict. d'Hist. Nat. p. 449 (1816).

Capito lathami, Vieill. N. Dict. d'Hist. Nat. p. 449 (1816).

Megalaima rubricapilla, G. R. Gray, Gen. Birds, p. 429 (1846); Kelaart, Prodromus, Cat. p. 127 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 448; Goff. Mus. Pays-Bas, *Buccones*, p. 26 (1863).

Megalaima lathami, G. R. Gray, Gen. Birds, p. 429.

Megalæma rubricapilla, Blyth, Cat. B. Mus. A. S. B. p. 68 (1849); Bonap. Consp. Av. p. 144 (1850).

Xantholæma rubricapilla, Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 646; Blyth, Ibis, 1867, p. 297; Marshall, Monogr. Capit. pl. 44 (1871); Holdsworth, P. Z. S. 1872, p. 430; Legge, Ibis, 1874, p. 15, et 1875, p. 284.

Le Barbet à couronne rouge, or the *Red-crowned Barbet*, Brown, Ill. xiv. (1776); *Le Cabezon à couronne rouge*, Vieill. N. Dict. d'Hist. Nat. p. 497; *The Rose-crowned Barbet*, Marshall; *The Red-fronted Barbet*, *The "Copper-smith*," also *Bell-bird*, Europeans in Ceylon.

Mal-kotoruwa, lit. "Flower-Barbet" (from its gay colours).

♂ *ad.* prasinus, plumis quibusdam cyaneo lavatis: remigibus saturatè brunneis, extùs dorsi colore lavatis: caudâ viridi: narium plumis flavis: lineâ angustâ frontali nigrâ: vertice et fronte scarlatinis posteà nigro marginatis: strigâ supra- et infraoculari flavâ: facie laterali genisque viridi-cyaneis: gutture toto lætè flavo, maculâ jugulari scarlatinâ: corpore reliquo subtùs viridi flavo lavatâ: subalaribus flavidis: rostro nigro, ad basin schistaceo: pedibus saturatè corallinis: iride rufescenti-brunneâ.

Adult male and female. Length 6·0 to 6·2 inches; wing 3·0 to 3·15; tail 1·4; tarsus 0·75; outer anterior toe and claw 0·75; posterior toe 0·65; bill to gape 0·85 to 0·9.

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* This species has usually been styled the "Red-fronted Barbet;" but the next, though not so called, has also a red forehead; and therefore, taken in reference to Ceylon ornithology, the present name will, I think, be better.

Iris brown or reddish brown; bill black, pale beneath at the base; legs and feet opaque coral-red, claws blackish; orbital skin dull red.

Forehead and a spot on lower part of throat crimson, a black border at the base of culmen, and another above the crimson patch passing behind the eye to the cheeks; a superciliary stripe, cheeks, chin, throat, and round the crimson neck-spot shining gamboge-yellow, bases of throat-feathers black; from the black coronal band to tail, including the wings, dark green, tinged with bluish on the crown; outer primaries and inner webs of all the quills blackish brown, margined internally with yellowish; wing-coverts and back in many specimens edged bluish green; a patch of pale blue over the ear-coverts and side of neck, passing up into the bluish edgings of the crown; beneath, from the chest (which is washed with the yellow of the throat) pale green, with bluish edgings on the sides of the breast in some.

The amount of black on the crown varies, the band being narrowest in newly-plumaged examples, the black bases of the head-feathers amalgamating with it in abraded dress.

Young. Bill blackish; iris brown; legs and feet bluish brown. Forehead green, somewhat paler than crown, no trace of red band: throat yellowish, and the yellow cheek-spot present; crimson throat-spot wanting: green of upper and under surface as in adult. This is the plumage on first merging from the nest. Shortly afterwards the red throat-spot and frontal band are acquired.

Obs. This little Barbet is allied, but not very closely, to its South-Indian representative, *X. malabarica*, which also has the forehead and the space round the eyes, as well as the chin and throat, crimson; the occiput is black passing into blue; cheeks and sides of neck dull blue. In size it is similar to the Ceylonese bird; wing about 3·2 inches.

Distribution.—The Little Ceylon Barbet inhabits almost all the low country except the hot scrubby districts on the sea-board in the south-east and north-west of the island; but it is much more common in the southern than the northern half. In the Galle district it is very abundant, extending into the southern ranges to an altitude of 2500 feet; it is almost equally so all through the Western Province, and extends through the N.W. Province (beginning to be less abundant at Chilaw) into the northern forest tract, in some parts of which it is more plentiful than the next species, which is essentially a northern bird. About Trincomalie and along the north-east coast to Mullaittivu it dwells chiefly in the jungle some miles inland, while *Xantholæma indica* is found near the coast as well as in the interior. Mr. Holdsworth did not observe it at Aripu, which is a region unsuited to its habits; but it frequents the interior towards the Central Road, and is also found in the Jaffna peninsula.

In the Kandyan Province it is common in Dumbara and about Pusselawa, Hewahette, and other localities, but is less so in Uva than the next species. From this region it is found at intervals in the Eastern Province out to the east coast; and in the forest country from the base of the Haputale range to the edge of the scrub or "brush" country near Hambantota it is fairly common.

Habits.—This Barbet chiefly frequents cultivated country, scattered woods, the edges of paddy-fields, native gardens, compounds, and cocoanut-plantations; but in the wild districts of the north and east it is partial to luxuriant forest, in which it usually takes up its quarters near some spreading banyan-tree or other source of frugivorous supplies. It is one of the most noticeable birds about native villages, taking up its abode among the bread-fruit and jack-trees, and uttering its curious note, which has gained for it, as well as for the next species, of which the voice is somewhat similar, the name of "Copper-smith." It sits perfectly upright on the top of a tree, being very partial to the *Bombax malabaricum,* and jerks out its monosyllabical cry *wok, wok, wok,* slowly repeated, with a bob of the head at each note, and then breaks forth into *wok wok wok wok,* as if it had suddenly become impatient at the result of its parlance with its inattentive mate. It is usually solitary, or if accompanied by a mate appears not to dwell in very close fellowship with it, except, of course, during the breeding-season, when it may be seen in pairs in the same tree. It lives entirely on fruits and seeds like the rest of its congeners, but does not congregate in such flocks as the next species. The flight of this Barbet is tolerably swift, but of necessity somewhat laboured; it is performed with quick beatings of the wings, with now and then a long dipping motion.

Nidification.—The breeding-season of this little bird lasts from March until June, and it usually nests in the decayed branches of living trees, the bread-fruit (which is generally much encumbered with small, dead, top branches) being a favourite resort with it. It plies itself to the task of excavating the hole with great assiduity, first of all slowly tapping the wood all over until it has found what it imagines is a soft place; very often, after working in for an inch or so, it will find that the wood is too hard for its capabilities, and will then try another spot in the same branch. A nest I once found was in the topmost branch of a bread-fruit; the habitation was an old one, but close to it were one or two essays at making a fresh hole; the wood had evidently proved too hard and it had returned, perhaps reluctantly, to the old nest. The branch was about 4 or 5 inches in diameter, and the hole entering the cavity 2 inches and perfectly round; the nest was about 6 inches below the aperture, and the young, which were three in number, reposed upon the bare wood without any nest-lining whatever. The eggs are glossy white, rather spherical in shape, and measure about 0·9 by 0·65 inch.

In the Plate accompanying this article the figure of the young bird represents the nestling after quitting the nest.

XANTHOLÆMA HÆMACEPHALA.

(THE CRIMSON-BREASTED BARBET.)

Bucco hæmacephalus, Müll. Syst. Nat. Suppl. p. 88 (1776).
Bucco flavigula, Bodd. Tabl. Pl. Enl. p. 30 (1783).
Bucco philippensis, Gm. Syst. Nat. i. p. 407 (1788).
Bucco indicus, Lath. Ind. Orn. i. p. 205 (1790).
Capito philippensis, Vieill. N. Dict. d'Hist. Nat. iv. p. 498 (1816).
Megalaima philippensis, G. R. Gray, Gen. B. ii. p. 429 (1846); Blyth, Cat. B. Mus. A. S. B. p. 68 (1849); Kelaart, Prodromus, Cat. p. 127 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 447.
Xantholæma indica, Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 644 (1856); Jerdon, B. of Ind. i. p. 315 (1862); Holdsworth, P. Z. S. 1872, p. 430; Legge, Ibis, 1875, p. 284.
Megalaima hæmacephala, G. R. Gray, Cat. B. Brit. Mus. *Capit.* p. 10 (1868).
Xantholæma hæmacephala, Marshall, Mon. Capit. pl. 42 (1871); Hume, Nests and Eggs (Rough Draft), p. 131 (1873); id. Str. Feath. 1873, p. 453; Ball, ibid. 1874, p. 466; Hume, ibid. 1875, p. 77; Armstrong, ibid. 1876, p. 311.
Le Barbut des Philippines, Brisson; *Le Cabezon à gorge jaune*, Vieill.; *The Crimson-gorgeted Barbet*, Marshall; *Copper-smith*, Europeans in Ceylon; *Kat-khora*, Hind., or *Tambayat*, lit. "Copper-smith"; *Chota bassant bairi*, or *Chota Benebo*, Beng.; *Tokoji*, Telegu. *Kotoruwa*, *Mal-kotoruwa*, Sinhalese; *Kokoorupan*, Tamil (Layard).

Adult male and female. Length 6·0 to 6·1 inches; wing 3·0 to 3·15; tail 1·5; tarsus 0·8; outer anterior toe and claw 0·75; bill to gape 0·9 to 0·97.

Iris reddish brown, with a pale or pearly-grey outer circle; eyelid red; bill black; legs and feet coral-red.

A broad frontal band and a patch across the lower part of throat glistening crimson; lores, the top and sides of head behind the eye, ear-coverts, and cheeks black; chin, throat, a stripe above the eye, and a patch on the cheek sulphur-yellow; hind neck, back, and wings sap-green, slightly pervaded with bluish on the occiput; tail and outer webs of quills bluish green; outer primaries and inner webs of all the quills blackish brown, margined inwardly with whitish yellow; below the chest-patch green, washed next the crimson with yellow; breast and lower parts whitish, with broad dark green centres to the feathers, darkest on the flanks, and fading on the centre of the belly; bases of wing-coverts blackish, under wing yellowish.

The extent of black on the occiput varies, and specimens are likewise often seen with the back and wing-coverts edged yellowish green.

Young. Iris dark brown; legs and feet yellowish red. In the fully-plumaged nestling the crimson forehead and chest are wanting, the former being concolorous with the crown, which is dusky green: the yellow throat- and facial-spots are not so bright as in the adult; the lower part of the face and space just behind the eye only are blackish: the upper surface is pale-edged, and that part of the chest which is crimson in the adult is dull green: under surface much as in the adult, but the centres of the feathers are paler. Traces of the black crown are perceptible in the blackish bases of the feathers there.

Obs. Ceylonese specimens are identical with Indian in character of marking &c., but the latter may perhaps average somewhat larger. An individual from Kamptee has the wing 3·2 inches, another from "North India" 3·25. In some specimens the pale portions of the breast-feathers are strongly tinged with yellowish. Birds from the Burmese countries, says Mr. Hume, are not different from Indian; and an example from Acheen (Sumatra) is indistinguishable, as regards colour, from Indian examples, although somewhat smaller and shorter in the bill.

Distribution.—The little "Copper-smith" is diffused throughout all the dry region of Ceylon, commencing

in the south a few miles west of Tangalla, and extending round the east side of the island (including the interior from the coast to the eastern slopes of Madulsima) to the extreme north. From the Jaffna peninsula it inhabits the west coast as far south as Madampe, the limit of its range extending thence across the country to Kurunegala, where it is very common. From Kurunegala it is found all along the base of the west Matale hills to Nalanda, and round to Bintenne; while all through the forests of the interior, stretching north of Dambulla, it is common. From the lowlands below Madulsima it ascends into Uva, in which region it is the prevalent small Barbet; but it does not cross the Hakgala ridge, and, in fact, its numbers decrease gradually to the west of the Badulla valley, and it is not very plentiful in the Uva patna basin. From Badulla it extends round the base of the hills, being found up their slopes to a height of about 2000 feet to Maturata and Hewahette, in which valley I have seen all four species together in the same ravine. In the north-east monsoon it strays in small numbers into Kandy, and as far even as Peradeniya, in the gardens at which place I have heard it in February. It is resident a little to the east of Kandy, namely at Hangerankette. It will be seen that the range of this bird in Ceylon is entirely determined by climate, and is one of the most interesting of such cases to be found in the whole list of Ceylonese birds: the lower portions of the Kandy country towards the east are dry, and there this little Barbet establishes itself, and in the dry season penetrates to the west almost until it meets its fellows permanently residing in the low country of the North-west Province. The distance between Peradeniya, the most westerly point at which I have observed these birds coming from the east, to Kurunegala, where western birds are common, is not 20 miles in a direct line. I should not wonder if it be found in this intervening space, should naturalists take the trouble to look for it. I have never heard it myself at the back of Allegalla peak, and I do not know the low-lying cheena-hills between it and Gallagedera.

Beyond the confines of Ceylon the Crimson-breasted Barbet has a wide range. Jerdon speaks thus of its habitat:—"It is found throughout all India, extending into the Burmese countries, Malayana, and the isles." In some of the latter regions it is perhaps as common as it is in India. Capt. Feilden and Mr. Oates speak of it as common throughout Pegu, and Dr. Armstrong found it in abundance in thin forest-jungle in the Irrawaddy delta. In Tenasserim it is recorded as common; and Col. Tickell states that there appear to be two races of it in that Province, one of which inhabits the dense lofty forests, and the other the open country and villages, the two differing somewhat in voice. Mr. Davison procured it at Acheen.

In Southern India I find that Mr. Bourdillon does not state it to be an inhabitant of the Travancore Hills; but Mr. Fairbank found it common up to 4000 feet in the Palanis, which form an eastern spur of the former range, and are, I have no doubt, much drier. In Central India and Bengal it is widely distributed, extending westwards into the Guzerat district, but not as far as Sindh, nor is it found in the Punjab or the Himalayas.

Habits.—This quaint little bird, being an inveterate fruit-eater, is found in all localities where trees affording it its favourite food are to be found. In the hills it affects scanty jungle and wooded ravines and hollows; but in the low country it is found, in addition to jungle, woods, groves, &c., in the gardens of the natives and the grounds surrounding the bungalows of the Europeans. It was a constant resident in the Fort at Trincomalie, and there I had much opportunity of observing its curious habits and manners. It appears not to indulge much in its powers of wing, but is a quiet retiring little bird, taking up its abode in the shady banyan or other such fruit-bearing monarch of the forest, and flying from branch to branch as it gorges itself with the ripe berry. If disturbed it flies off a short distance, and sits on the top of a neighbouring tree, twisting its head about and looking intensely stupid, until it suddenly remembers that its mate must be somewhere near, and it then commences its singular metallic-sounding call, resembling the syllable *wonk-wonk-wonk*. This is slowly repeated, and sounds like the striking of a hollow copper vessel; it is very distinct from the quicker sharper *wok-wok-wok* of the Ceylonese Barbet. In the breeding-season it delivers this note from morning to night, continuing it to a most monotonous extent without cessation: the pair sit close together, and utter it in concert, each note being accompanied by an odd-looking combined forward and sideward jerk of the head; and as of course both birds do not move together, the sound appears to come from different directions. I find that Sundevall takes another view of this curious effect; he writes, as quoted by Jerdon, "the same individual always utters the same note, but two are seldom heard to make it exactly alike. When, therefore, two or more birds are sitting near each other, a not unpleasant music arises from the alternation of the

notes, each sounding like the tone of a series of bells." The difference in sound, as I have already remarked, is produced by the alternate twisting of the birds' heads, that of one being directed towards, while that of the other is turned away, from the listener while the note is being delivered. Jerdon, I remark, advocates the same reason.

This Barbet has been stated to run up the trunks of trees; this it assuredly does not; it may be seen clinging to the bark of a tree at the commencement of the breeding-season, tapping the wood in order to find some soft or hollow place to make its nest in, but it has no power of proceeding up the surface of the trees. It congregates in large flocks, in company with Pigeons, to feed on the fruit of the Banyan-, Bo-, and Palu-trees, and quickly returns to the feast after being frightened away.

Nidification.—This species breeds from January until June, April being, I imagine, the month in which most young are reared. It generally nests in small decayed branches, boring them on the lower side when they happen to be slanting. As is the case with the former species, it selects, if possible, a branch that is hollow, and cutting its neatly-made round entrance, lays its eggs at the bottom of the cavity. Should the branch not be hollow, however, it will excavate to a depth of 6 inches or more, and will even continue to deepen it year after year. An instance of this is given by Jerdon, who had a pair breeding year after year in the cross beam of a vinery in his garden; the cavity was lengthened annually until "the distance from the original end was 4 or 5 feet." Another entrance was made from the underside, as was the first, and about 2½ feet from the nest. A pair that bred in a tree opposite my bungalow in the Fort at Trincomalie took from a fortnight to three weeks to construct the entrance and a short internal cavity. The opening was on the underside of a branch inclined at about 30°. The birds took it by turns to work, and the assiduity with which they laboured at the solid branch was extremely interesting. The little "carpenter" clung to the bark beneath the orifice, and swinging its body sideways and backwards would bring the whole of its strength to bear on the blow which it delivered with its stout little beak. I observed that the tail was seldom used as a support unless when a very vigorous blow was about to be dealt. When tired he would fly to an adjacent branch and look at the work with a contented aspect, and after a rest commence anew.

Mr. Parker writes me that he once watched one working at a hole in a most sedate manner. "After swaying his body sideways a little, whilst he was selecting a suitable chip to attack, he very gravely gave two or three sharp taps with his bill and detached a piece of wood. He then, *after looking round him*, proceeded in the same way to select another chip and detach it, and so on, as if he intended to spend his whole existence at the work."

Mr. Adam describes a nest which was made in the fork of a dead branch lying by the side of a thoroughfare, and so small that it could easily be lifted by the hand.

The eggs are usually three in number and are of an elongated shape; they are pure white, and have a pinkish tinge before being blown; they average 0·99 by 0·69 inch (*Hume*).

PICARIÆ.

Fam. CUCULIDÆ.

Bill more or less slender, curved, and compressed; the nostrils exposed and variable in position; gape wide. Feet zygodactyle; the outer anterior toe longer than the outer posterior one. Tail more or less long and broad.

Subfam. CUCULINÆ.

Nostrils swollen; the head sometimes crested. Tail variable. The tarsi feathered anteriorly, and the thigh-feathers long, hiding the tarsus. Stomach villous. (*Sharpe*, P. Z. S. 1873, p. 579, in part.)

Genus CUCULUS.

Bill moderately slender; gape wide, the culmen gently curved. Nostrils round, apert and basal. Wing tolerably long and pointed; the 3rd quill the longest, and the 1st shorter than or subequal to the 7th. Tail graduated, generally long. Tarsus not longer than the middle toe, feathered above at the front, the lower part covered with broad transverse scales. Inner anterior toe much shorter than the outer, and not so long as the outer posterior one.

CUCULUS CANORUS.

(THE COMMON CUCKOO.)

Cuculus canorus, Linn. Syst. Nat. i. p. 168 (1766); Sykes, P. Z. S. 1832, p. 98; Gould, B. of Europe, pl. 240 (1837); Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. p. 219; Blyth, Cat. B. Mus. A. S. B. p. 71 (1849); Layard et Kelaart, Prodromus, Suppl. Cat. p. 60 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 452; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 702 (1856); Blakiston, Ibis, 1862, p. 325; Jerdon, B. of Ind. i. p. 322 (1862); Holdsworth, P. Z. S. 1872, p. 430; Gould, B. of Gt. Britain, vol. iii. pl. 67 (1873); Hume, Nests and Eggs (Rough Draft), p. 133 (1873); Ball, Str. Feath. 1874, p. 393; Bligh, J. A. S. (Ceylon Branch), 1874, p. 67; Hume, Str. Feath. 1875, p. 78; Butler, ibid. 1875, p. 460; Scully, ibid. 1876, p. 134; Hume, ibid. p. 288; Blakiston and Pryer, Ibis, 1878, p. 227; Dresser, B. of Europe, pt. 69 (1878).

Cuculus hepaticus, Sparrm. Mus. Carls. iii. pl. 55 (1787).

Cuculus borealis, Pall. Zoogr. Rosso-Asiat. i. p. 442 (1811).

Cuculus indicus, Cab. et Heine, Mus. Hein. iv. p. 34 (1862–3).

Cucu, Spanish (Saunders); *Phu-Phu* in Dehra Doon; *Kukupho*, Lepchas; *Akku*, Bhotan (Jerdon); *Kako*, Japanese (Blakiston); *Kakkok*, Turkestan (Scully).

Adult male (Kotmalie). Length 13·5 inches; wing 8·6; tail 7·2; tarsus 0·85; outer anterior toe and claw 1·1; bill to gape 1·17.

These are the dimensions of a very fine example shot in Ceylon. I subjoin others from specimens procured in different parts of the world, beginning with those contained in Dr. Scully's very complete notice of Eastern-Turkestan Cuckoos.

	Length. in.	Expanse. in.	Wing. in.	Tail. in.	Tarsus. in.	Bill from gape. in.	Weight. oz.
(1) Five males. Yarkand	12·8 to 14·0	23·0 to 24·0	8·5 to 8·9	7·0 to 7·7	0·8 to 1·0	1·15 to 1·3	3·2 to 4·5
Two females, juv., rufous. Yarkand	12·3 to 13·2	22·8 to 23·5	8·0 to 8·5	6·6 to 6·9	0·9	1·15 to 1·2	2·8 to 3·8
(2) Examples in Brit. Mus.:—							
Athens	13·0 (from skin)	..	8·9	6·8	0·8		
Germany	..	..	8·5	7·0	0·85	1·2	
Persia	..	..	8·6	7·0			
N.W. Province	..	..	8·9	7·0	0·9	1·1	
♀. "India"	..	..	8·3				
♂. Sweden	..	..	8·9	7·5	0·9	1·2	

Iris yellow, pale yellow; bill, upper mandible and tip of lower blackish, base of under mandible greenish yellow; gape and eyelid yellow; inside of mouth red; legs and feet yellow; claws dusky.

Above dusky bluish ashen, with a slight greenish gloss generally on the interscapular region; the rump and upper tail-coverts more bluish than the back; quills plain brown, crossed on the inner webs with pointed marginal bars of white, reaching to within about 2 inches from the tips of the longer primaries; winglet and primary-coverts darker than the quills; edge of the wing beneath the winglet white; tail blackish, with a slaty hue; the tips of the feathers white; the five lateral feathers on each side with central white spots, sometimes limited to one in number, and marginal indentations of the same on the inner webs and sometimes on both; the outermost feathers more spotted than the rest.

Throat and fore neck delicate ashen, blending on the sides into the darker hue of the hind neck; from the chest downwards white, crossed with narrow wavy bars of blackish, broadest on the flanks; vent and base of under tail-coverts unmarked; under wing-coverts white, marked as the chest; a wash of slate-colour along the under edge of the wing.

Young. Variable in plumage; more or less marked with rufous.

Above greenish brown, the green lustre very strong in some; the head, hind neck, back, and lesser wing-coverts with white tips to the feathers; quills and primary-coverts mostly barred with rufous, the inner parts of the bars whitish; tail more boldly spotted than in the adult, the white spots running into rufous adjacent patches; under surface buffy white, with bolder and darker bars than in the adult, which extend also to the throat, where they are closer together than on the breast. There is often a white nuchal patch.

After moulting the nest-plumage, specimens have the lower part of the throat and also the chin washed with buff, and the lower parts often retain the buff tinge; the bars are darker and sharper-edged than in old birds.

Rufous phase of young. Barred more or less on the whole upper surface with rufous bands, occasionally very broad, and predominating on the rump and upper tail-coverts over the slaty-brown ground-colour; the under surface is white as in others, barred with bold black bands.

Obs. Although the moderately close character of the barring which distinguishes adults of this Cuckoo from others is the same in all specimens, yet I notice a considerable variation in the bars themselves, consisting in their width and in the appearance of the edges, some being more softened off than others.

Cabanis and Heine separated the Indian Cuckoo, alleging that it was a smaller bird than the European; but the specimens which they had to deal with were doubtless those of *C. himalayanus*, now recognized to be quite distinct from *C. canorus*.

Distribution.—There have been two instances of the occurrence of the Common Cuckoo in Ceylon; and it is only to be wondered that a bird in which the migratory instinct is so powerful as in this interesting

species has not been oftener met with in the island, particularly as on the other side of the Bay of Bengal it has been found as far south as Timor, lat. 10° S. Layard obtained the first example in the old Botanical Gardens at Kew, Colombo; and Mr. Bligh the second, which he shot on the Harangolla Patnas, Kotmalie, on the 7th October, 1873. This was at an elevation of about 4000 feet, lower than which it is not likely that the Cuckoo would reside in Ceylon during its stay. Layard's specimen was killed, of course, *en passant* to the hills.

Our English harbinger of spring can therefore only be looked upon as a mere straggler to Ceylon; but notwithstanding, as it is a bird which recalls home recollections to many of my readers who perhaps feel themselves exiled to the beautiful island of Lanka, I feel constrained to say more concerning its distribution, habits, and strange career as a nestling than the limits of this work on a local avifauna would otherwise warrant. During the breeding-season the Cuckoo inhabits more or less the whole of the Asiatic continent north of the Himalayas, extending its range as far north as the limit of forest-growth, considerably within the Arctic circle, and extending westwards from Japan right across to the neighbouring continent of Europe, over which it is entirely diffused, being of course, as regards the various districts in which it has been noticed in both regions, locally common and locally scarce: to the south of the Himalayas many birds remain and perhaps breed as low down as the latitude of Calcutta. Within its ordinary breeding-limit, however, it is to some parts only a visitant; Mr. H. Whitely records it as such to Hakodadi, in Japan. In China, says Swinhoe, it "occurs in the mountains of the south in spring, extending northwards to Pekin. During its migration we met with it on the plains." Mr. Blakiston notes it as common on Fujisan, one of the Japanese islands.

In Eastern Turkestan, writes Dr. Scully, it arrives on the plains about the middle of April (this is from the south of course), and leaves about the beginning of August. In Persia, Mr. Blanford says that it abounds; he heard its note frequently in the Baluchistan hills in February and March, and he is of opinion that it breeds in the Persian highlands, for he met with it in May in the wooded hillsides and valleys of Fárs. To Palestine it is also a summer visitant from the south; Canon Tristram ('Ibis,' 1866, p. 285) did not observe it before the 30th March; it was generally spread over the country, and was particularly abundant in the Jordan valley. As above remarked, it is spread over the whole of Europe to the extreme north. Messrs. Alston and Harvie Brown record it as very abundant at Archangel; in Sweden and Norway it is likewise common; and as regards the British Isles it travels to the extreme limit of the Shetlands, arriving in the south at the end of April, and laying, according to Mr. G. Dawson Rowley's observations, as early as the 1st of May. It does not appear to remain in Spain during the summer, merely passing through on its northward migration from Africa: Mr. Saunders did not find it laying anywhere in the country.

In North Africa it is a spring and autumn visitor, passing through on its way to the north from more southerly latitudes. Captain Shelley has shot it as early as the 30th April; and Von Heuglin states that it arrives from the south in March, and lingers on its way north until May, returning so soon again as August. These must be, in all probability, birds that have bred in the south of Europe. In Lower Nubia, Professor Hartmann heard it in May, and again in September and October. In Tangier it is common, arriving in spring from the south. On the west coast it has been procured in Fantee by Governor Ussher, in Damara Land, South-west Africa, by Mr. Andersson, and in Natal by Mr. Ayres. In South Africa, however, where it winters, it is evidently by no means common, as there are comparatively few instances of its capture there; where, therefore, the number of birds that pass through North Africa spend the winter has yet to be determined, and will most likely prove to be the upland regions of the continent, or the country of the great lakes so prominently brought before the world of late years by our great African travellers.

In Asia, where we have been discussing its summer habitat, its winter quarters are well known. In Bengal it is common, and thence is spread all over India to the extreme south, where it is rare. In the north-west of the latter country it is a spring visitant, passing through, according to Captain Butler, in May, and moving towards the hills; after the breeding-season it returns again, and is very plentiful in September. Neither Mr. Bourdillon nor Mr. Fairbank record it from the Travancore hills; and the latter does not speak of it in the Deccan, although Jerdon says that it remains two or three months in the spring in Central India, and that he heard its call at Goomsoor, Saugor, and Nagpoor in May and June. On the other side of the bay it is evidently a mere straggler, occurring in Pegu and perhaps in the Malaccan Peninsula and islands between there and Timor, which is its utmost limit to the south.

Habits.—The Cuckoo chiefly affects openly wooded or park-land, avenues of trees, the borders of woods, scrubby commons or wastes where a few trees are here and there interspersed among the low growth, in which its foster-parents usually nest. In the breeding-season, however, it wanders about so much that it may be found in the heart of large woods; and I observe that Mr. Blanford mentions hearing it in the jungles of the Persian hills. Shortly after arriving in the various localities where it intends to rear its young its welcome note may be heard from daybreak until late in the morning resounding merrily through the woods, which teem with numerous joyful songsters, not a few of which are perhaps destined to be the foster-parents of the Cuckoo's offspring, and to have their own ignominiously expelled by the unprincipled and unscrupulous little stranger! There is no bird in Europe about which so many strange theories have existed in the popular mind as the "harbinger of spring." Strange crimes and misdemeanours have been accredited to it from the earliest times; and among these, as is stated by the ancient writer and naturalist Pliny, none is so dire as its devouring its foster-parent; he remarks, "The young Cuckoo being once fledged and ready to fly abroad is so bold as to seize on the old titling and to eat her up that hatched her." Although we must absolve the Cuckoo from such a want of gratitude as is here depicted, yet the conduct of the young nestling, as will be noticed directly, is in the highest degree unnatural. It is believed by many that the old birds possess the power of fascinating the species in whose nest their egg is to be deposited, such a belief having obtained from the erroneous idea that the Cuckoo actually lays its egg in the nest it has chosen, which it certainly does not. A great difference can be detected in the sound of the Cuckoo's note as uttered by different birds, some giving it out as *wuk-koo,* the first syllable being very plainly pronounced. The Yarkandis syllabize it by the word *kak-kok,* which Dr. Scully says he thinks is a better representation of the note than ours. It is the love-call of the bird, and after the breeding-season, as is well known, ceases to be heard, causing many to think that the Cuckoo has left her accustomed haunt, whereas in reality it has only become silent. I have observed in England that it is usually heard before 9 or 10 o'clock, after which the bird is more or less silent until evening, when it again becomes as garrulous as it was in the morning. The Cuckoo's flight is powerful and very Hawk-like, being performed with regular beatings of the wing; it generally flies a moderate distance, mounting into an upper branch, where it alights and commences its note at once, which it continues for a little time and then becomes silent before moving on again. It is most noisy just at the time of laying.

Its diet is insectivorous and varied, consisting of caterpillars, grubs, worms, moths, and small insects. The stomach is clothed inside with a thick hairy or villous coating, which is, I believe, peculiar to all the subfamily Cuculinæ; at least all I have shot in Ceylon possess this character in a greater or less degree.

Nidification.—The chief amount of interest which attaches to the singular economy of the Cuckoo is naturally centered in its nidification, and the strange habit, as exemplified in the whole group of true Cuckoos, of fostering its young upon other birds. Connected with this are many points of great interest to the naturalist, such as its supposed polygamy, its instinct of laying eggs of a peculiar type to suit those with which it is deposited, its partiality for Warblers' nests, the fact of eggs of peculiar coloration prevailing in different localities, and the habit of conveying the eggs in the bill after laying them and then depositing them in the nest chosen to receive them, all of which justly tend to render the natural history of the Cuckoo one of the most interesting of any bird known.

In India the Cuckoo has been ascertained to lay during the latter half of May and the first half of June (Hume, 'Nests and Eggs'), usually choosing the nests of Pipits and Chats; among the former the Upland Pipit (*Heterura sylvana*) and Jerdon's Rock-Pipit (*Agrodroma jerdoni*), and among the latter the Indian Bush-Chat (*Pratincola indica*), the dark grey Bush-Chat (*P. ferrea*), the white-winged Black Robin (*P. caprata*), and the Magpie Robin (*Copsychus saularis*) appear to be the favourite species. In the Almorah district Mr. Brooks says they lay in the nests of *P. indica* and *C. saularis,* and Mr. Thompson in the nests of Pipits. At Murree, Captain Marshall found the eggs in the nests of *A. jerdoni* and *P. ferrea,* and Mr. Hume obtained two eggs in the nests of *Heterura sylvana* near Kotegurh.

In Europe it has a great partiality for nests of Warblers; and in a long list of about a score of these birds given by Dr. Baldamus, in his exhaustive article in the 'Naumannia,' 1853, are mentioned the Blackcap, the Robin, the Garden-Warbler, the Whitethroat, the Lesser Whitethroat, the Reed-Warbler, the Wood-Warbler, the Marsh-Warbler, the Redstart, the Grasshopper-Warbler, the Nightingale, and the Willow-

Wren; other species given by the same author are the Common Wren, the Hedge-Sparrow, the Pied Wagtail, the Yellow Wagtail, the Marsh-Pipit, the Meadow-Pipit, the Skylark, the Yellow Bunting, the Butcher-bird (*Lanius collurio*), the Tree-Pipit, the Crested Lark, the Wood-Lark, the Reed-Bunting, the Brambling, the Crossbill, and the Linnet. Mr. Cecil Smith, in his 'Birds of Somersetshire,' mentions also an instance of a Blackbird's nest; in addition to which I may cite those of the Thrush, Great Tit, Turtle Dove, and Wood-Pigeon. It will be observed that the majority of these birds have much too small nests for the Cuckoo to be able to lay in, and that into some she of course could not enter, which fact alone would prove what used to be doubted by many naturalists, but is now universally accepted by all who have given their attention to the matter, viz. that the Cuckoo deposits her eggs in the nest by carrying them in her bill. Birds of late years have been killed with the eggs in their mouths; and I myself have seen one shot rising from an Essex meadow with an egg in its bill.

Females hang about certain localities for days, and having in the mean time discovered a nest which suits them, lay their eggs and, watching the opportunity when the rightful owners are away, convey them to their destination. A struggle not unfrequently ensues between the Cuckoo and the foster-parent, evidences of which are seen in broken egg-shells and other signs of a scuffle having taken place. The same bird, it has been ascertained, only deposits a single egg in one nest, and that generally after the rightful owner has begun to lay. Of this even the natives of Central Asia have cognizance; for Dr. Scully tells us, in his paper in 'Stray Feathers,' that the Yarkandis told him so, giving the nests in which the eggs were deposited as those of the Brown Shrike (*Lanius arenarius*), the Red-headed Bunting (*Euspiza luteola*), and the Indian Blue-throat (*Cyanecula suecica*). They say, he remarks, that all Cuckoos are of the female sex, and are not very particular in their choice of husbands, frogs being selected indifferently with birds! The latter strange idea emanates, no doubt, from the Cuckoo in Yarkand giving, according to Dr. Scully, "a prolonged sort of cry, somewhat resembling that of the toad (*Bufo viridis*), but somewhat louder." Dr. Baldamus contends that each Cuckoo lays "eggs of a certain colouring only, which corresponds with that of the eggs of some one species of Warbler, in the nest of which she deposits them;" but Mr. G. Dawson Rowley has found that this is not always the case.

The most remarkable feature, however, in the economy of the Cuckoo has yet to be noticed; and this is the extraordinary faculty in the young chick which prompts it, when newly born, and *before its eyes are open*, to eject its foster-brethren from the nest; and coupled with this is the scarcely less singular devotion evinced by the bereaved foster-parent for the little monster who has thus deprived her of the rearing of the rest of her offspring. With regard to the conduct of the young Cuckoo, it may not be known to all of my readers that a long account of it was published in the last century by Dr. Jenner, who gave the results of his observations in the 'Philosophical Transactions' for 1788. For a long time the Doctor's account of what he saw did not secure that amount of credence which it should have. The fact seems to have been known to the ancients that the young Cuckoo got rid of its fellow nestlings; but this, according to Pliny, was by the simpler method, perhaps, of devouring them, which somewhat rough treatment was, he considered, rather encouraged than otherwise by the unconscious foster-parent; for, writes he, "she joyeth to see so goodly a bird, and wonders at herself that she hath hatched and reared so trim a chick. The rest, which are her own, indeed, she sets no store by; yea, and suffereth them to be eaten and devoured of the other, even before her face."

Of late years the experience of Dr. Jenner has been verified by the observations of a lady in Scotland devoted to the subject of natural history, and who, in a little book on the Pipits, gave a sketch of what she saw. She was afterwards requested to publish an account of the proceeding in detail in 'Nature,' which she did. I quote here in part from Mrs. Hugh Blackburn's story as follows:—"The nest (which we watched last June, after finding the Cuckoo's egg in it) was that of the common Meadow-Pipit, and had two Pipit's eggs, besides that of the Cuckoo. It was below a heather bush, on the declivity of a low abrupt bank on a Highland hill-side in Moidart. At one visit the Pipits were found to be hatched, but not the Cuckoo. At the next visit, which was after an interval of forty-eight hours, we found the young Cuckoo alone in the nest, and both the young Pipits lying down the bank, about ten inches from the margin of the nest, but quite lively after being warmed in the hand. They were replaced in the nest beside of the Cuckoo, which struggled about till it got its back under one of them, when it climbed backwards directly up the open side of the nest, and

hitched the Pipit from its back on to the edge. It then stood quite upright on its legs, which were straddled wide apart, with the claws firmly fixed halfway down the inside of the nest, among the interlacing fibres of which the nest was woven; and, stretching its wings apart and backwards, it elbowed the Pipit fairly over the margin so far that its struggles took it down the bank instead of back into the nest. After this the Cuckoo stood a minute or two, feeling back with its wings, as if to make sure that the Pipit was fairly overboard, and then subsided into the bottom of the nest.

"As it was getting late, and the Cuckoo did not immediately set to work on the other nestling, I replaced the ejected one, and went home. On returning next day, both nestlings were found dead and cold, out of the nest. I replaced one of them; but the Cuckoo made no effort to get under and eject it, but settled itself contentedly on the top of it. All this I find accords accurately with Jenner's description of what he saw. But what struck me most was this: the Cuckoo was perfectly naked, without a vestige of a feather, or even a hint of future feathers; its eyes were not yet opened, and its neck seemed too weak to support the weight of its head. The Pipits had well-developed quills on the wings and back, and had bright eyes, partially open; yet they seemed quite helpless under the manipulations of the Cuckoo, which looked a much less developed creature. The Cuckoo's legs, however, seemed very muscular, and it appeared to feel about with its wings, which were absolutely featherless, as with hands, the 'spurious wing' (unusually large in proportion) looking like a spread-out thumb. The most singular thing of all was the direct purpose with which the blind little monster made for the open side of the nest, the only part where it could throw its burthen down the bank. I think all the spectators felt the sort of horror and awe at the apparent inadequacy of the creature's intelligence to its acts that one might have felt at seeing a toothless hag raise a ghost by an incantation. It was horribly 'uncanny' and 'grewsome'"*.

Comment upon this extraordinary feat is unnecessary, suffice it to say that the testimony of other observers is forthcoming to prove that the young Cuckoo ejects its companions when still in a perfectly unfledged state, thus displaying a more wonderful instinct than perhaps exists throughout the whole range of the bird creation!

. Concerning the attachment of the foster-parents to their tyrannical offspring, I quote as follows from Mr. Gould's admirable article in the 'Birds of Great Britain':—"How wonderfully solicitous are the little birds for its welfare, and with what spirit do the foster-parents defend their nurtured Cuckoo. If its removal be attempted they display the greatest uneasiness. Wagtails will even fly in the face of the person who thus teases them; and if it be returned to them they will evince their joy by fondling and dancing around it, leaping over its back, and exhibiting many other demonstrations of delight. Yet in a few days their charge will wing its way to the leafy branch of some tree in the forest, and there sit uttering most strange, piercing, bat-like notes, varied occasionally by others resembling the syllables *chat-chat*." The affection displayed by the Wagtail in particular for the young Cuckoo, inciting it to feed it when grown to three times its own size, is well delineated in Mr. Gould's magnificent plate, in which a Pied Wagtail is drawn standing (as it was actually seen) on the back of a Cuckoo seated on a fence, and depositing a caterpillar in its upturned and gaping mouth. Touching the habits of the young, I subjoin from the same article the following interesting paragraph:—"A young Cuckoo, which was taken from the nest of a Wagtail at Formosa (Berkshire), exhibited many strange actions, which very strongly reminded me of a rattlesnake. If the hand was put towards it, it raised itself on its legs, protruded its neck, puffed out its feathers, and threw its head forward with a quick and determined stroke, precisely like a snake or viper, struck the hand with the open mouth, just as a snake would do, and immediately drew the head back in readiness for another stroke. On the second day after it was taken, the bird was sufficiently reconciled to me and my daughter to take small pieces of raw beef or mutton and caterpillars from the hand, but continued to utter its piercing shriek whenever we approached it. Does not this peculiar electrifying shriek attract the attention of the smaller birds when it requires food? A delicate ear will hear this sound for thirty or forty yards, and it is probably heard at a still greater distance by the smaller birds."

The two types common in Cuckoo's eggs are the red and the grey. The ground-colour is whitish in some,

* 'Nature,' No. 124.

streaked and spotted with brownish red and purple; in others it is stone-coloured or pale reddish, blotched with brownish grey, yellowish brown, or brownish red.

They average about 0·9 by 0·7 inch.

For permission to give the accompanying woodcut I am much indebted to the kindness of Mr. Gould. It is a copy from his facsimile of Mrs. Blackburn's sketch in the 'Pipits.'

CUCULUS MICROPTERUS.

(THE INDIAN CUCKOO.)

Cuculus micropterus, Gould, P. Z. S. 1837, p. 137; Blyth, J. A. S. B. 1842, xi. p. 902; Kelaart, Prodromus, Cat. p. 129 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 452; Jerdon, B. of Ind. i. p. 326 (1862); Swinhoe, P. Z. S. 1871, p. 395; Holdsworth, P. Z. S. 1872, p. 430; Legge, Ibis, 1874, p. 16; Hume, Str. Feath. 1875, p. 79.

Cuculus striatus, Blyth, Cat. B. Mus. A. S. B. p. 70 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 703 (1856); Cab. et Heine, Mus. Hein. iv. p. 37 (1862).

Cuculus affinis (A. Hay), Blyth, J. A. S. B. 1846, xv. p. 18.

Great-billed Cuckoo, Blyth; *Ashy Mountain Cuckoo*, Kelaart.

Bou-kotako, Bengalese; *Takpo-pho*, Lepchas.

Adult male (Ceylon). Length 12·2 inches; wing 7·75; tail 5·8; tarsus 0·7; outer anterior toe 0·8; bill to gape 1·24.

An example from Sumatra measures—wing 8·2 inches; tail 6·8; bill to gape 1·11. A male from Pegu—length 13·3; expanse 23·5; wing 8·25; bill from gape 1·35: a female—length 12·4; wing 7·6; bill from gape 1·3. (*Oates.*)

Iris brown; bill dark horn at base of upper mandible, the tip blackish; under mandible fleshy, with a dark tip; gape and orbital skin yellow; legs and feet ochre-yellow, claws dusky.

Back, wings, and tail brownish ashy, with a metallic or bronze lustre; the head and hind neck dusky slate-colour, blending imperceptibly into the hue of the back; wings light ash-brown, the inner webs of the primaries and secondaries crossed with marginal bars of white, except at the tips, the secondaries white at the base of the inner webs; tail light cinereous brown, with tips and a series of shaft-spots of white, a blackish subterminal bar and blackish shaft-streaks between the white spots, outermost feathers barred with white.

Lores, face, throat, and fore neck pale ashy, the cheeks darker than the rest; from the chest downwards white, with distant blackish, clear-margined bars; under tail-coverts with the longer feathers only barred; under wing-coverts buff-white, irregularly marked with black bars.

An example not quite adult has the concealed portions of the hind-neck feathers barred with rufous, and the chest-feathers tipped and transversely marked with a paler hue of the same; the lateral upper tail-coverts, which lie concealed, have the outer webs barred with rufous and white, with the interspaces dark brown.

This Cuckoo is at once recognized at a glance from *C. canorus* by the presence of the dark caudal bar.

Young. A specimen in nest-plumage from Darjiling has the upper surface a lustrous ruddy brown, all the feathers more or less deeply tipped—on the head and hind neck with buff-white, on the back and wing-coverts with rufous, the extreme tips being whitish, and on the rump and upper tail-coverts with dusky rufous, the quills tipped and their inner webs barred with rufous; both margins of the central tail-feathers indented with rufous, and the tips of all the feathers fulvous-white, the outermost pair barred with rufous, and the next two pairs with the inner webs only barred with the same; there is no bar, but the terminal inch of all the feathers is unmarked, imparting the appearance of a band; under surface buff, barred heavily with blackish brown; the markings of the chest not so regular as on the breast and flanks.

An immature bird shot at Nalanda, Ceylon, is glossy grey-brown above, with a subdued ashen hue on the hind neck and head; there is a lightish stripe above the eye and a narrow dark edge in front of it; greater secondary wing-coverts tipped with rufous, the primaries and secondaries tipped with white, and the latter indented outwardly with rufous; tail much as in the adult, but with the margins of the feathers indented with rufescent; chin and lower part of chest washed with rufescent; a dark brownish patch on the sides of the chest, and the central portion barred with blackish brown; under parts with the bars broader than in the adult.

Obs. The synonymy of this species is in a somewhat confused state, owing to Drapiez (Dict. Class. Hist. Nat. vol. iv. p. 570) having described a Cuckoo from Java in 1823, of a cindery-brown colour ("brun-cendré") above, and

12 inches in length, which some unite with Gould's bird, discovered many years after in the Himalayas, but which others join with *C. himalayanus* of Vigors, a perfectly different bird, and not belonging to the terminal-bar-tailed group at all. It is scarcely possible to affirm what the *Cuculus striatus* of Drapiez really was; it was evidently an immature bird, as the outer primaries were indented with rufous; the dimensions of the wing were unfortunately not stated: taking all things into consideration it appears to me to have belonged to the brown bar-tailed section and not to the ashy one, of which *C. canorus* is the type. *C. himalayanus* is a miniature of this latter. Mr. Seebohm procured it on the Yenesay river; it migrates to China and Japan, and goes down to the Malay archipelago in winter; but so does the present species. In the British Museum is a specimen from Sumatra labelled *C. affinis*, with the wing 8·2, bill to gape 1·1 (this is identical with a Ceylonese example), and another from the Himalayas labelled *C. micropterus* (this has, perhaps, the bars on the lower parts broader, and is slightly darker on the throat and chest than the Ceylon bird; the bill across the gape is 0·75 inch, while the latter measures 0·71). Mr. Oates measured a male shot in Pegu as, wing 8·25 inches, bill from gape 1·35; a female, wing 7·6, bill from gape 1·3. The bills are very large in these, and Mr. Hume considers *C. micropterus* to refer to these large-billed birds. Perhaps there are two races of this Cuckoo in the Himalayas; but we do not know whether Gould's type had an exceedingly large bill or not. The Ceylonese birds which I have seen certainly are not so large in the bill as these latter specimens; but they evidently migrate from the Himalayas, and they most decidedly are not *C. himalayanus*. What the *C. affinis* of Lord A. Hay was is not quite clear. I cannot therefore apply his name to our bird, nor can I Drapiez's, if his species is to be considered the same as Vigors's (*C. himalayanus*, an altogether different type of bird), and therefore I must allow it to stand under Gould's name as heretofore.

Distribution.—This Cuckoo arrives in Ceylon during the month of October; but apparently its numbers are extremely limited, as but comparatively few examples have ever been recorded from the island. Kelaart speaks of it as a mountain species of rare occurrence and found in Dimbulla; Layard did not meet with it. Holdsworth writes that "the only two examples he met with were obtained in half-cultivated land in low country near Colombo." These were probably in migration to the hills at the time they were killed. I have shot it in the Kottowe forest near Galle, and have seen it in the same district on another occasion. It probably affects the subsidiary hills in the south-west of the island as much as any other part of the low country. I met with a Cuckoo, which I did not procure, but which I identify as belonging to this species, in the forests between Anaradjapura and Trincomalie; and Captain Wade, of the 57th Regiment, killed an immature individual at Nalanda at the north base of the Kandyan ranges; in addition to which I have seen it in the collection of Messrs. Whyte and Co., the specimen having been procured in Dumbara. It is doubtless a commoner species in reality than it appears to be, but, being a denizen of the forests, escapes nearly all observation during the period of its visit.

There is, I think, no doubt that this species migrates to Ceylon *viâ* the south of India from the Himalayan region; it is evidently very rare in the Peninsula. I notice that Messrs. Bourdillon and Fairbank do not record it in either of their lists from the southern hills; the latter notes it from Ahmednagar, but makes no comment as to its scarcity or otherwise. Jerdon found it rare on the Malabar coast and in the Carnatic, but "tolerably common in the jungles of Central India, as at Nagpore, Chanda, Mhow, and Saugor."

Taking the large-billed race to be only a local variety of the species which visits Ceylon, we find Mr. Hume recording this Cuckoo as "common throughout Lower and Eastern Bengal, and even up into the lower valleys of the Himalayas, in Sikkim, Bhootan, and Assam." In Pegu, according to Mr. Oates, it is numerous everywhere, but less so in the plains than in the hills. From Burmah it finds its way eastwards to China, where Swinhoe found it on the Upper Yangtsze; southwards it migrates in the cool season through the Malaccan peninsula to the archipelago, whence it has been procured in Java and Sumatra, and probably will some day be obtained in Borneo, if it has not been already met with there. Lord Tweeddale refers with doubt four examples procured in the Andamans by Lieut. Ramsay to this species; but the measurements of the wings, viz. 7·0 and 7·37 inches, are almost too small for *C. micropterus*.

Habits.—The Indian Cuckoo frequents high jungle and forest, particularly that on the sides of hills. It is a shy bird and keeps, as far as I have observed, to the tops of tall trees. It is very Hawk-like in flight, having much the appearance of a small Accipitre as it wings its way from the summit of one lofty tree to another. I noticed it in the Kottowe forest fly out of the upper branches of an enormous Hora-tree, and after proceeding

a short distance alight on the very top of an equally high dead trunk. Its habit of keeping to the uppermost branches of these giants of the forest leads to its being seldom procured. Jerdon writes that it "repeats its call more frequently than other Cuckoos; this," he remarks, "is a double note of two syllables each—a fine, melodious, pleasing whistle, which the natives of Bengal attempt to immitate by their name *Bokutako*." Mr. Oates says that its note is double and very melodious, and that it selects the topmost bough of a tree (generally a dead one) and remains calling there for a quarter of an hour or more. Its loquacious habit, like that of the Plaintive Cuckoo, is evidently confined to the breeding-season; I never heard it, on the several occasions I have seen it in Ceylon, utter a note.

Its stomach is highly villous, and its principal food consists of caterpillars.

Its eggs have not yet been identified; but some suppose that it lays in the nests of Babblers (*Malacocerci*).

CUCULUS POLIOCEPHALUS.

(THE SMALL CUCKOO.)

Cuculus poliocephalus, Lath. Ind. Orn. i. p. 214 (1790); Blyth, J. A. S. B. 1842, p. 904, et Cat. B. Mus. A. S. B. p. 71 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 704 (1856); Jerdon, B. of Ind. i. p. 324; Hume, Nests and Eggs, p. 135 (1873).

Cuculus himalayanus, Gould, Cent. Him. Birds, pl. 54 (1832).

Hierococcyx poliocephalus, Bp. Consp. Gen. Av. i. p. 204 (1850).

Cuculus bartlettii, Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 452 (juv.).

Cuculus lineatus, Less. Traité d'Orn. p. 152.

Cuculus tamsuicus, Swinhoe, Ibis, 1865, p. 108.

Cuculus ——?, Blakiston and Pryer, Ibis, 1878, p. 227.

The Hoary-headed Cuckoo of some Indian writers.

Daugham, Lepchas; *Pichu-giapu*, Bhootias (Jerdon).

Hototogisu, Japanese.

Adult male and female. Length 10·0 to 10·75 inches; wing 6·0 to 6·2; tail 5·2 to 6·0; tarsus 0·75 to 0·85; outer anterior toe and claw 0·9 to 1·0; bill to gape 1·0 to 1·1. Expanse 17·3.

The above dimensions are from three examples procured in Ceylon. A Japanese specimen measures—wing 6·3 inches; tail 5·7.

Iris brown or brownish grey; bill, upper mandible and tip of lower blackish, gape, base of under mandible, and eyelid yellow; inside of mouth the same, but the base of the palate orange-red; legs and feet yellow, tarsus washed with brownish; claws brownish yellow.

Above almost uniform bluish ashen, illumined strongly with greenish, mostly on the scapulars; upper tail-coverts more bluish than the back; primaries slaty brown, with a greenish tinge, barred with white; tail blackish, tinged slightly with green, tipped with white, with a series of white shaft-spots and marginal indentations of the same; throat and fore neck pale fulvous, shaded with an ashen hue, and which colour blends softly into the grey of the sides of the neck; beneath, from the neck downwards, white, with the vent and under tail-coverts pale buff: breast, flanks, and thigh-coverts crossed with narrow softened-edged bars of blackish.

The above description is taken from a well-preserved Japanese example in Mr. Seebohm's collection, which is identical with Indian specimens.

Young. Above ashy brown; the feathers of the head more or less tipped with white, these markings being often confined to the superciliary region and occiput. Upper back, scapulars, and wing-coverts tipped and barred with whitish or pale fulvous; the lower back and upper tail-coverts marked with a series of white central transverse spots, the latter more or less barred with rufous as well; primaries and secondaries barred on the outer webs with rufous, and on the inner with white, changing somewhat into rufous near the tips; tail spotted as in the adult, and the central feathers barred with rufescent; chin and throat fulvous, barred with pale brownish; under surface as in the adult.

Individuals vary much *inter se* in the markings of the upper surface, some specimens being banded with rufous instead of white. An example shot in March at Colombo is acquiring the adult plumage, having the attire of the head, back, and rump mixed with bluish-ashen feathers.

Rufous phase. This species commonly assumes a rufous phase. Two individuals from Nepal which I have examined in the British Museum are entirely rufous above, with the head, hind neck, back, scapulars, and wing-coverts banded with blackish slaty, having a perceptible greenish lustre: in one the rump and upper tail-coverts are almost unmarked, the feathers only having terminal bar-like spots; the wings are greenish brown, barred with yellowish rufous; the tail glossy dark brown, barred with incomplete angular rufous bars, the feathers all tipped with whitish; chin and throat yellowish rufous, narrowly barred with blackish; breast and lower parts white, crossed with widely-separated blackish bars; edge of under wing rufous, the rest of it white, barred with black.

Obs. I have examined a specimen of the Small Cuckoo from Madagascar, the *Cuculus rochii* of Hartlaub (P. Z. S. 1862, p. 224), and which is kept distinct from *C. poliocephalus* by Mr. Sharpe in his admirable paper on the Cuckoos of the Ethiopian region, on account of its darker upper surface and the somewhat different banding of the under parts, the dark bars, according to him, being broader and the white interspaces wider. It is entirely the same as the Japanese specimen above described; the upper surface has the same hue, and the breast and lower parts barred the same, the under tail-coverts having precisely the same buff hue. I think that the two species will have to be amalgamated; and if so, the great range which the Small Cuckoo will then acquire will be only second to that of *C. canorus.*

Distribution.—The present species was described in the 'Annals and Magazine of Natural History' by Layard as new, under the title *C. bartlettii.* His specimen was in immature plumage; and he writes of the bird that he obtained many examples of it both at Pt. Pedro and Colombo. Mr. Holdsworth does not seem to have identified it while he was in Ceylon, but speaks of a Cuckoo, closely resembling *C. canorus,* which he saw in an English garden in Colombo; and this I imagine, though it is very much smaller than the latter, must have, in reality, been this Cuckoo. It is, of course, migratory to Ceylon, and appears as isolated individuals on the west coast in October. Some years it is not seen at all, and during others several examples may perhaps come under the notice of collectors. Not a few were seen in the neighbourhood of Colombo in October 1876, one of which I procured at Borella, and another was shot near Kotté and preserved in the Colombo Museum. In December 1869 I obtained an example (immature, as are all which I have seen from Ceylon) on some trees at the lake side of the Galle face. It does not seem to have been noticed anywhere but in the Jaffna peninsula and about Colombo. It probably leaves the island in April.

On the continent it appears to enjoy a wide rage; but is found more often in Northern than in Southern India, which makes its occasional occurrence in Ceylon somewhat noteworthy. It is known from the Nilghiris, but less so from the low country in the south of the peninsula. Mr. Fairbank records it from Ahmednagar, and Jerdon procured it as far south on the east coast as Nellore. He says that it is found throughout the Himalayas, migrating sparingly to the plains in the cold weather. "At Darjiling," he remarks further, "it is tolerably common, beginning its call still later in the season even than *Cuculus himalayanus,* this being rarely heard before the end of May, and continuing till the middle of July." Dr. Stoliczka procured it in Ladak, and to the eastward of the Himalayas it extends all the way to China and Japan, in the latter of which countries it is not uncommon. Swinhoe received specimens from Amoy and Szechuen and from North-west Formosa. In Java Mr. Wallace procured it, his specimens being, according to Blyth, similar to those from "the Himalayas and the Nilghiris," and, he adds, "from the mountains of Ceylon." It is not clear how he identifies it from the latter locality, for, according to my knowledge, it does not affect the hill-region at all. A specimen from Morty Islands, in the British Museum, is identical in plumage with other examples of this Cuckoo which I have examined, but is much longer in the wing, measuring 6·8 inches.

Habits.—The Small Cuckoo frequents low trees and stunted jungle near open places, and appears to be a tame bird, being stupidly heedless of observation, and allowing a near approach before taking wing. Jerdon remarks of it, "It is a very noisy bird, and has a loud, peculiar, unmusical call, which it frequently utters both when seated on a branch and when flying from tree to tree." . . . . . "The Bhootias," he adds, "attempt to imitate this in their name (*Pichu-giapu*) for the species."

It appears to feed much on caterpillars, one which I shot in my compound at the Colombo Lake being in the act of taking them from a plaintain-tree at the time.

Nidification.—Mr. R. Thompson says this species lays in May and June. An egg, which Mr. Hume believes to belong to this species, was taken by Mr. Brooks from the nest of a Warbler (*Reguloides superciliosus*), and is described as being an elongated, cylindrical ovate egg, and pure white and glossy; it measured 0·81 by 0·57 inch.

CUCULUS SONNERATI.

(SONNERAT'S CUCKOO.)

Cuculus sonnerati, Lath. Ind. Orn. i. no. 24, p. 215 (1790); Blyth, J. A. S. B. 1842, p. 906; id. Cat. B. Mus. A. S. B. p. 72 (1849); Kelaart, Prodromus, Cat. p. 129 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 452; Jerdon, B. of Ind. i. p. 325 (1862); Holdsworth, P. Z. S. 1872, p. 430; Legge, Ibis, 1874, p. 15, et 1875, p. 284.

Cuculus himalayanus, Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. p. 220.

Polyphasia sonnerati, Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 699 (1856).

Penthoceryx sonnerati, Cab. et Heine, Mus. Hein. iv. p. 16 (1862); Walden, Ibis, 1872, p. 367.

Le petit Coucou des Indes, Sonn. Voyage aux Indes, ii. p. 211 (1782); *Sonnerat's Cuckoo*, Lath. Syn. Suppl. p. 102; *The Banded Bay Cuckoo*, Jerdon; *Rufous Cuckoo* of some; "*Fine-weather Bird*," Planters in Ceylon.

Punchi koha, lit. "little Cuckoo," Sinhalese.

Adult male. Length 9·5 to 10·0 inches; wing 4·9 to 5·1; tail 4·8 to 4·9; tarsus 0·7; outer anterior toe 0·65, claw (straight) 0·25; bill to gape 1·1.

Iris brownish red, paling at the outer edge to slaty and in some to yellowish; bill blackish, gape fleshy yellow or reddish; base of lower mandible bluish, in some yellowish; inside of mouth orange-reddish; legs and feet brownish slaty, or bluish leaden in some, the soles yellowish, claws dusky blackish.

Forehead, top of the head, hind neck, upper surface, and wings hair- or nut-brown, with a green lustre, barred on the head, body, and wing-coverts with rufous-bay; feathers of the forehead with white bases, showing as spots on the surface; on the hind neck the bars almost monopolize the feather and are lighter; the upper tail-coverts have marginal spots or indentations of, and are tipped with, rufous; the quills and primary-coverts are unbarred, but are rufescent whitish inwardly, and are externally finely edged with rufous; tail deep brown, tipped white and edged or indented with rufous-bay, the inner webs of all but the centre feathers rufous with dark bars next the shaft, these latter have rufescent tips sometimes and at others want the light extremities altogether; entire under surface and feathers above the eye and down the side of the head between the nape and ear-coverts white, with narrow wavy blackish bars; ear-coverts darkish; the under tail-coverts and flanks, and in some specimens (probably young) the lower parts, tinted with fulvous; edge of wing white.

Female. Is, according to my experience, generally a smaller bird than the male. Length 9·5 inches; wing 4·5 to 4·9: bill to gape 1·0 to 1·05.

Iris hazel or reddish, with a yellowish outer circle; bill lighter than that of the male.

Has the upper-surface bars paler than in the male, and the under tail-coverts pure white or less coloured than the other sex.

Scarcely any two specimens of this Cuckoo are barred above precisely alike; with age the transverse marks seem to reduce themselves.

Young. Birds of the year are said to be more coarsely barred with paler bands than the adult, and to have the lower parts more tinged with fulvous.

Immature birds cannot be confounded with the rufous phase of *Polyphasia*, being, first of all, stouter or more massive, the bill much wider; and, secondly, they are more narrowly barred, and the under surface is all white, whereas in the latter the throat, chest, and generally the breast and abdomen are rufous.

Obs. This handsome little Cuckoo is closely allied to the Malayan species *C. pravatus*, Horsf., which inhabits Malacca and many of the islands of the Archipelago, including Sumatra, Java, and Borneo. This is a much smaller bird and more neatly barred, and wants the green gloss on the upper surface. Two individuals which I have examined

in the national collection from Malacca measure in the wing 4·45 and 4·1 inches, and another from Sumatra 4·2. Lord Tweeddale gives the wings of three examples as follows:—Candeish, 4·88 inches; Malabar, 4·75; Maunbhoom, 4·88. An individual from Tenasserim in the British Museum, which is scarcely separable from an immature bird from Ceylon, has the wing 4·6, appearing to be intermediate between the true *C. sonnerati* and *C. pravatus*.

Distribution.—The Bay Cuckoo is a resident in Ceylon, and scattered pretty freely over the island, but is nowhere very common, except in the Eastern Province. In this part it is frequent in many localities. I found it, particularly in the tank-district, affecting the open country between the Friars-Hood hills and the sea, and also cheenas in the vicinity of the tanks. In the north-eastern districts I have observed it chiefly in the north-east monsoon. In the South-west and in the Western Province it occurs in isolated places. I have either met with or procured it at Wackwelle near Galle, at Kaduwella near Colombo, in the Kuruwite Korale, at Ambepussa, and one or two other spots. Mr. Parker records it from Uswewa, and I have heard it in the North-central Province.

During the north-east monsoon it appears to ascend the hills, and is not uncommon in many parts of the Kandy country and also in Uva; it is styled by the planters in some coffee-districts the "Fine-weather Bird," from its habit of calling before fine weather sets in.

Elsewhere this species is found almost only in the Southern and Central parts of India. Mr. Hume ('Stray Feathers,' 1875, p. 79) speaks of Captain Feilden procuring specimens of a Bay Cuckoo in Pegu which corresponded with Jerdon's description of *C. sonnerati*; and I have seen an individual from Tenasserim, as mentioned above, which could scarcely be separated from a Ceylonese specimen. Whether these will eventually prove to be the true *C. sonnerati* or not, I am unable now to say; but if they should, it will much extend the range of the species.

Jerdon writes, "This elegantly marked little Cuckoo is found in the forests of Malabar and Travancore, where it appears tolerably common, also on the sides of the Nilghiris and in the Wynaad, and more rarely on the Eastern Ghâts, about the latitude of Madras." Of late neither Mr. Fairbank nor Mr. Bourdillon have procured it in the above-mentioned localities; but the former records it from Khandalla, and Lord Tweeddale likewise from Maunbhoom, which is the most northerly locality from which I have heard of it.

Habits.—This bird frequents open places in the jungle, the edges of tanks where there are dead trees, sparsely-timbered country, and cheenas. It is very shy, and chiefly affects the tops of trees, where it remains motionless for a long time, piping its curious far-sounding whistle, which may be syllabized as *whī-whip, whiwhip—whī-whip, whiwhip.* It is particularly noisy in the morning before 9 or 10 o'clock, and in the evening just before and at sunset, calling for a considerable time without intermission, and consequently making its presence known wherever it has taken up its abode. When in forest it is difficult to find, being a small bird and generally seated across some horizontal branch near the top of the tree; but should there be an isolated tree standing in the open, near the edge of the forest-clearing or cheena, there the Banded Bay Cuckoo is sure to post itself, and then can easily be seen. In the Eastern Province I have come upon three or four in as many separate trees standing close together; they do not seem to care about cultivating any close intimacy, though they are not unfrequently found in scattered company. Their call-notes are different from the whistle just mentioned; commencing in a low key they suddenly change to a higher, and then die away into scarcely audible sounds. When approached they fly off to an adjacent tree, and commence calling anew. The diet of this species consists chiefly of Coleoptera, Mantidæ, and caterpillars.

Nothing seems to be known of the nidification of this species. Mr. Hume, it is true, mentions that an egg taken from the oviduct of one of the birds shot by Captain Feilden was bluish grey; but it does not seem quite certain to what species these specimens belonged.

CUCULUS PASSERINUS.

(THE INDIAN PLAINTIVE CUCKOO.)

Cuculus passerinus, Vahl, Skriv. af Nat. Selsk. iv. p. 57 (1797).

Cuculus niger, Blyth, J. A. S. B. 1842, xi. p. 908.

**Polyphasia tenuirostris*, Hodgs. Cat. B. Mus. E. I. Co. ii. p. 698 (1856, in part).

Cuculus tenuirostris, Kelaart, Prodromus, Cat. p. 129 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 453.

Polyphasia nigra, Jerdon, B. of Ind. i. p. 333 (1862).

Ololygon passerinus, Gray, Hand-list Birds, ii. p. 217 (1871); Hume, Nests and Eggs, p. 136 (1873); Ball, Str. Feath. 1874, p. 394; Butler, ibid. 1875, p. 461; Ball, ibid. 1876, p. 235.

Polyphasia passerina, Jerdon, Ibis, 1872, pl. i.; Holdsw. P. Z. S. 1872, p. 431; Legge, Ibis, 1875, p. 284.

Narrow-billed Cuckoo, Kelaart; *Pousiya*, Mahrattas; *Chinna katti pitta*, Telugu.

Koha, Sinhalese.

Adult male and female. Length 8·75 to 9·2 inches; wing 4·4 to 4·5; tail 4·5; tarsus 0·65; outer anterior toe 0·65, claw (straight) 0·23; bill to gape 0·9.

Iris light red or yellowish red, in some red with a well-defined yellowish outer circle; bill blackish, often with a reddish tinge, the base of lower mandible slightly paler, inside of mouth orange-red; legs and feet (very variable) light reddish brown or greyish brown with a yellowish tinge, in some dusky reddish and in others yellowish; soles yellow, claws blackish.

Above dark ashy, blending on the sides of the neck into the uniform pale cinereous of the throat, chest, and breast; upper back, scapulars, and wing-coverts glossed with greenish; rump and upper tail-coverts more bluish than the head, the former edged with white at the base; quills plain brown; tail dark ashy blue, deeply tipped, barred on the inner webs, and edged outwardly towards the base with white; under tail-coverts, vent, and lower part of belly white, blending into the hue of the breast.

In some specimens there is more white on the abdomen than in others; and at times the under tail-coverts even are sullied with grey. Some individuals, otherwise in the normal adult plumage, have the tail scarcely tipped, and the inner edge of the feathers only slightly indented with white; and occasionally the tail is devoid of white markings.

Young. Birds of the year vary considerably in their coloration; but their prevailing character is to be marked with rufous, and nearly always on the tail (this has the mesial spots and marginal bars rufous), and the chin and throat with more or less of the same colour, while the under surface is marked with whitish or fulvescent bars. In some the caudal bars are white near the tips of the feathers and rufous at the base.

Hepatic phase. This species assumes frequently a rufous plumage analogous to that in which the common Cuckoo is often found. An example shot in March at Colombo has the upper surface, wings, tail, sides of the neck, and throat bright rufous; the feathers of the head and hind neck with a few terminal bars of blackish; the back, scapulars, and wing-coverts barred with greenish black; the terminal portion of the quills and the entire outer webs of the first primaries dull brown; shafts of the tail-feathers and a subterminal spot black, tips of all but

* The trifling differences in the bill and plumage of the members of this genus are not, I consider, sufficient to separate it from *Cuculus* as restricted. The structure of wing and tail is nearly similar in both. The same may be said of the next species, which differs from *Cuculus* mainly in the metallic lustre of the plumage. The tail in the bronze Cuckoos is, as a rule, less graduated than in *Cuculus*; but it is variable, scarcely any two species being exactly alike.

the central pair whitish; under surface, under tail-, and under wing-coverts white, blending on the chest into the rufous of the throat and barred with wavy bands of blackish brown, which on the under tail-coverts are far apart; some of the tibial feathers rufous.

In other examples the breast and flanks, as well as the chest, are rufous, these birds being probably in a younger stage than those which have a considerable amount of white on the lower parts.

These rufous individuals, I imagine, remain so throughout life, perhaps losing the bars on the upper surface entirely, while the quills would remain more or less brown.

Obs. The allied species, *P. tenuirostris* of Gray, which replaces the present bird in Burmah and the countries to the east of India generally, is very similar to it on the upper surface and throat, but has the breast, belly, and under tail-coverts rufous, darkest on the latter, which is consequently the very opposite character to that displayed by the Plaintive Cuckoo. It has a rufous phase; but this differs slightly from that of the present species, the lower parts being banded more boldly, and the tail wanting the white tips.

Distribution.—The observations taken by various naturalists in Ceylon on the movements of this little Cuckoo tend to show that it does not make its appearance in all parts of the north of the island at the same time, the truth, doubtless, being that it arrives in one district and then wanders thence over the country, its distribution being materially influenced by climate. In the north-east, about Trincomalie, I have known it appear in the beginning of October, at which time it has scarcely done breeding in the south of India; it was common enough in suitable places in the interior long before Christmas. Layard, however, remarks that it appeared about Jaffna in February, a time when it should have been assembling for its return northward, and under which conditions he most probably saw it there. Mr. Holdsworth's experience is again scarcely less noteworthy; he did not notice it in the Aripu district before the beginning of January, from which it would appear that it visits the west coast considerably after its arrival on the other side of the island. It would not, however, be safe to assign to it any general period of arrival on the evidence of one or two seasons, as no doubt its appearance, as is the case with most migratory birds, varies considerably according to the kind of season and prevailing weather at the time at which it should be expected.

In the Galle district I have met with it in December, and in the Western Province have seen it about the same date. In these latter districts it does not occur in any great numbers, being a lover of dry climate. In the Hambantota country and all round the south-east coast it is very numerous. From the north down to Chilaw it is common, and in the Seven Korales and along the base of the Matale hills towards Kurunegala I have found it abundant in March. It has, I believe, been found in Dumbara, but I am not aware of its visiting any higher parts of the Kandyan country than that: in Uva it probably occurs at a greater elevation.

Concerning its distribution in India, Jerdon writes, "The Plaintive Cuckoo is found all over India in wooded countries. It is most abundant on the Malabar coast, in the Wynaad, and on the warmer slopes on the top of the Nilgherries, save in the Carnatic, but found here and there in jungly places and on the Eastern Ghauts; rare in Lower Bengal, and up to the foot of the North-west Himalayas." Its distribution seems to be rather peculiar in some districts; Mr. Ball says that it occurs rather sparingly in Chota Nagpur, that Captain Beavan procured a specimen in April in Maunbhoom, and that he himself got another in Sirguja in the same month. In the coast-region to the eastward he found it not uncommon in Orissa, but did not see or hear of it in travelling southward till he reached the western part of Raipur on the road to Nagpur.

Captain Butler writes, "The Indian Plaintive Cuckoo is not uncommon at Mount Aboo; it arrives about the beginning of June, and its mournful ventriloquistic note soon makes one aware of its presence." Mr. Hume follows with the observation that it is found nowhere else throughout the whole region round about Aboo. From these remarks it appears that this species moves about in India to a considerable extent, migrating in the northern parts to the westward during the breeding-season.

Habits.—The Plaintive Cuckoo certainly does not lay much claim to such a title in Ceylon, for there it is one of the most silent of birds, which fact leads one to the inference that its notes are chiefly uttered in the breeding-season. It frequents open scrubby lands, plains dotted with jungle, bushy wastes, and such like; when disturbed it flies from one low shrub to another, and perches generally upon the topmost branches. It is seen moving about a good deal in the early morning, and in the evening, in districts where it is numerous,

assembles in small parties and roosts in thick bushy trees. I found it in considerable numbers once on the Kimbulana-oya, an affluent of the Dedura-oya, flying in and out of the trees growing on the banks; the birds were very wary, and it was with difficulty that I could get within shot of them. It is usually not very prone to allow of a near approach, being of a restless disposition; but when met with alone is not nearly so shy as when associating together. It feeds on caterpillars, Coleoptera, and other large insects, and may often be seen taking them on the ground; its stomach is villous in a high degree.

Concerning its note, which is so well known in India, Jerdon writes that it is "a plaintive call of two syllables, the last one lengthened out, which Mr. Elliott made *whi, whew—whi whew whew*, and which may be written as *ka-veer, ka-vee-eer*, and to which the bird, by pointing his head in different directions as he sits calling, gives a most ventriloquistic effect." I would remark, it is by a similar means that the Hawk-Cuckoo imparts such a singular sound to its call.

Nidification.—This little Cuckoo lays its eggs in the nests of Wren-Warblers, the Yellow-eyed Babbler (*Pyctorhis sinensis*), and also in that of the Grey-backed Shrike (*Lanius erythronotus*). Miss Cockburn, a lady who has done much towards furthering our information on the oology of the South of India, is, according to Mr. Hume, the only person who has identified its eggs, having found them in the nest of the Common Wren-Warbler (*Drymoipus inornatus*) on the slopes of the Nilghiris. I subjoin the following note from her, which Mr. Hume gives in 'Nests and Eggs of Indian Birds':—"On the 17th of September, 1870, the nest of a Common Wren-Warbler, which had two small eggs, and a third, which was much larger, but of something the same colour. A few hours after another Common Wren-Warbler's nest was found, which also contained two small eggs, one of which was broken, and a large egg. These two nests were not far from each other; I took them both. On the 22nd September another nest of the same Warbler was found, which also contained a large egg and two small ones.

"The same day one of my servants, seeing a Plaintive Cuckoo sit very quietly on a hedge, shot it. On examination it was found to contain an egg ready to be laid, of the same colour and spots as those found in the little Warblers' nests. On the 26th September, a Common Wren-Warbler's nest was found, which had only a Cuckoo's egg in it. The Cuckoo was seen near the nest, and the little Warblers in a great fright; for the appearance and flight of the Cuckoo very much resembles that of a small hawk. On looking in the nest there was the egg. It was left for two or three days; but on going to the spot the nest was found to be deserted, so the Cuckoo's egg was brought away.

"On the 5th October, 1870, another Common Wren-Warbler's nest was found; but this time it was occupied by a young Plaintive Cuckoo, which entirely filled the wee nest, and had the boldness to peek at my finger every time I tried to touch it. The nest had no young Wren-Warblers. Whether the young Cuckoo had pushed the little Warblers out, or whether no other egg, except the Cuckoo's, was hatched, it is impossible to say. I regret not having seen the nest till at this stage of the young Cuckoo's existence. A week after it had left the nest, but was caught among the bushes close by. Considering the smallness of a Common Wren-Warbler's nest and one of the Warbler's eggs having been found broken in one of the nests, as mentioned above, there can, I think, be little doubt but that this bird, like its European namesake, must carry her egg in her mouth and drop it into the nest."

The eggs thus found were of "a delicate pale greenish blue, blotched and spotted boldly but sparsely, and almost exclusively towards the large end of the egg, with reddish or purplish brown and pale reddish purple. The markings seem generally to form a very imperfect and irregular, but still more or less conspicuous, zone round the large end."

In size they varied from 0·78 to 0·81 inch in length, and from 0·53 to 0·57 inch in breadth.

CUCULUS MACULATUS.

(THE INDIAN EMERALD CUCKOO.)

Trogon maculatus, Gm. Syst. Nat. i. p. 404 (juv.) (1788).

Chrysococcyx lucidus, Blyth, J. A. S. B. 1842, xi. p. 917; Jerdon, 2nd Suppl. Cat. B. S. India, Madr. Journ. 1845, xiii. no. 225.

Chrysococcyx smaragdinus, Blyth, J. A. S. B. 1846, xv. p. 53.

Cuculus (*Chrysococcyx*) *xanthorhynchos*, Layard et Kelaart, Prodromus, Cat. Suppl. p. 60 (1853).

Chrysococcyx hodgsoni, Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 705 (1856); Jerdon, B. of Ind. i. p. 338 (1862); Swinhoe, P. Z. S. 1871, p. 394.

Lamprococcyx smaragdinus, Cab. et Heine, Mus. Hein. iv. p. 13, note, no. 6 (1862).

Lamprococcyx maculatus, Holdsworth, P. Z. S. 1872, p. 432.

Chalcites hodgsoni, Gould, B. of Asia, pl. xxi. (1877).

Le Curucui tachcté, Brown, Ill. Ind. Zool. pl. 13.

Angpha, Lepchas (Jerdon).

Adult male and female. Length 6·0 to 6·4 inches; wing 4·0 to 4·3; tail 2·7 to 2·9; tarsus 0·5; outer anterior toe (without claw) 0·62; bill to gape 0·75.

Iris brown or reddish brown; bill yellow at the base, with the terminal portion brown; legs and feet reddish brown.

Above brilliant emerald-green, with more or less of a coppery tinge, most prevalent at the margins of the feathers; the back and scapulars with a golden lustre when viewed in some lights; quills metallic brown-green, the inner webs of the primaries rufous at the centre and white at the base; tail much tinged with coppery, the outermost feathers barred with white and the interspaces blackish green; throat metallic green; under surface white, crossed with bold bands of bronzed green.

Young. The immature bird has the back, wings, and rump metallic green, more or less overshot with a coppery gloss, and the feathers barred terminally with rufous and dusky green: the head and hind neck rufous, with a strong coppery lustre, the feathers barred with blackish brown, and sometimes with whitish as well; tail green, the feathers rufous externally, the outermost feathers mostly white, barred with black-green or blackish, the next two pairs barred with blackish and tipped with white; barring of the under surface duller than in adults.

Immature examples vary much in the extent and character of their rufous coloration. An individual in my collection has the back, scapulars, and wings brilliant emerald-green as in the adult, with the head and hind neck rufous, strongly illumined with coppery; the crown and nape barred with whitish and brown, the former across the centres of the feathers; the outermost feathers are white externally and rufous internally, barred with greenish black, the penultimate almost entirely rufous, with green cross bands on the inner webs and a broad subterminal bar of the same, the extreme tip being white; the next pair are rufous on the outer webs, barred with green.

Obs. This species is not very aptly named *maculatus*. It was figured by Brown from a young bird with spotted wing-coverts sent from Ceylon by Governor Loten; he named it the "Spotted Curucui," from which Gmelin gave it its title of *maculatus*, looking upon the bird, however, as a Trogon.

C. lucidus, with which this Cuckoo has been occasionally confounded, is found over most of the Australian continent, and differs from the Indian bird in being of a paler, more coppery, and less lustrous green on the upper surface, and the whole of the under parts are barred with metallic greenish copper-colour. The young bird is brownish above, the green colour being confined to the back and tail; the throat and chest tinged and barred with pale brownish. The wing in this species varies from 4·1 to 4·3 inches.

Distribution.—The fact alone of Brown recording his specimen of the "Spotted Curucui," figured in his 'Illustrations of Indian Zoology,' as having been sent from Ceylon by Governor Loten, entitles this species to a place in our lists. It has not, to the best of my knowledge, since been met with or heard of even in the

island; Layard knew nothing of it, and I conclude entered it in the catalogue of Ceylon birds by himself and Kelaart, published in the Appendix to the 'Prodromus,' solely on the authority of Brown.

It has not as yet been detected in Southern India, and Jerdon says it has been rarely procured even in the central part of the Peninsula; its habitat is essentially the sub-Himalayan region, and (according to Blyth) Arakan and Tenasserim. Jerdon obtained it at Darjiling, and Hodgson procured it in Nepal. Its occurrence in Ceylon can only be accounted for on the supposition of its having migrated southwards in the usual manner, following thus the example of all the true Cuckoos which visit Ceylon.

Habits.—But little is known of the habits of this lovely little bird; but they may, I have no doubt, be considered to resemble those of other members of this beautiful group. Gould writes of *C. lucidus* that "while searching for food its motions, although very active, are characterized by a remarkable degree of quietude, the bird hopping about from branch to branch in the gentlest possible manner, picking an insect here and there, and prying for others among the leaves and the corners of the bark with the most scrutinizing care." The same interesting manners are doubtless possessed by the present species. Jerdon states that the food of the one he shot at Darjiling consisted of insects.

Genus HIEROCOCCYX.

Bill wide at the gape. Wings shorter than in *Cuculus*; the 1st quill short and the 3rd longer than the 2nd. Tail subeven.

Plumage Hawk-like in character, the young being striped beneath.

HIEROCOCCYX VARIUS.

(THE COMMON HAWK-CUCKOO.)

Cuculus varius, Vahl, Skriv. af Natur. Selsk. iv. p. 60 (1797); Strickland, Ann. & Mag. Nat. Hist. 1846, p. 398; Blyth, Cat. B. Mus. A. S. B. no. 339, p. 70; Layard et Kelaart, Cat. Ceylon B. App. Prodromus, p. 60 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 452.

Cuculus fugax, Horsf. Tr. Linn. Soc. xiii. p. 178 (1821); Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. p. 219.

Cuculus lathami, J. E. Gray, Ill. Ind. Zool. p. 34, fig. 2 (1832).

Hierococcyx varius, Horsfield & Moore, Cat. B. Mus. E. I. Co. ii. p. 700 (1856); Jerdon, B. of Ind. i. p. 329; Holdsw. P. Z. S. 1872, p. 431; Ball, Str. Feath. 1874, p. 393; Bligh, J. A. S. (Ceylon Branch) 1874, p. 67; Bourdillon, ibid. 1876, p. 392; Ball, ibid. 1877, p. 413.

Bychan Cuckoo; *Sokagu Cuckoo*, Latham, Hist. of Birds.

Kupak or *Upak*, Hind.; *Kokgallo*, Bengalese; *Kuttipitta*, Tel.; *Takkhat*, lit. "Custom-house Bird," in Deccan; *Irolan*, Malabar (*apud* Jerdon).

Adult male and female. Length 13·0 to 14·7 inches; wing 7·4 to 8·2 (*Hume*); tail 6·5 to 6·8; tarsus 0·9 to 1·0; outer anterior toe and claw 1·2 to 1·3; bill to gape 1·15 to 1·3.

Females are smaller than males. The above limit of the wing is that of a male, and must be exceptional. Several specimens I have examined from Ceylon and N.W. India vary from 7·5 to 7·8 inches, which I imagine is about the average limit.

Iris yellow; bill, upper mandible and tip of lower brown, base of under mandible and gape yellow; orbits bright yellow; feet gamboge-yellow, claws dusky at the tips.

Above dark ashen grey, darkest on the interscapular region and palest on the rump and upper tail-coverts; basal margins of the feathers on the hind neck more or less rufous, showing on the surface of the plumage; quills and winglet grey-brown; inner webs of primaries partly crossed from the edge with wide bars of white, more or less mottled with grey; extreme tips of the secondaries pale; tail brownish ashen, tipped with rufous and crossed with a broad subterminal band of blackish brown, above which are four narrow bars of the same, with an adjacent pale cross ray at the lower edge, which expands and is more conspicuous on the outer feathers; under surface of the light portions whitish.

Lores, cheeks, and ear-coverts bluish ashen; chin ashen, the extreme point darkest; throat and chest rufous, the centres of the feathers bluish grey in some, with the basal edges whitish, in others the whole basal portion of the feather is bluish grey; lower part of chest, breast, and flanks barred with the same on the rufous ground, which pales gradually into unmarked buff-white on the belly, vent, and under tail-coverts; under wing-coverts pale rufous or fulvescent, the greater series barred with bluish ashen; under surface of quill-bars buff-white.

When not fully adult the markings of the under surface are darker and the rufous is confined to the chest. A specimen shot by Mr. Bligh in Kotmalie has the lores whitish; the chin and cheeks dark slate, with the centre of the throat white; the chest is washed with rufous, this colour is barred with slate, which gradually darkens on

the breast into brown on a white ground-colour, the bands being at the same time edged with rufous; thigh-coverts, vent, and under tail-coverts pure white; under wing-coverts buff, cross-rayed with brown; under surface of the quill-bars pure white.

Young. Above dark cinereous brown, barred on the lower part of the hind neck, back, scapulars, and wing-coverts with rufous; on the hind neck the bases and margins of the feathers are of this colour: primaries and secondaries barred exteriorly with rufous, internally with buff, shading into rufous near the shaft; tail-feathers tipped with rufous and white, the subterminal bar very broad, and the remaining four more developed than in the adult, the pale succeeding cross rays being rufous and the interspaces ashen; on the three lateral pairs of feathers the cross rays are whitish on the inner webs; forehead and crown ashen brown, scarcely marked with rufous; beneath buffy white, the throat and fore neck marked with broad mesial striæ of cinereous brown: the feathers on the sides of the neck edged with rufous; breast with angular transverse spots of the same, which become more *bar-like on the flanks*; belly and under tail-coverts unmarked; under wing-coverts rufescent, barred with brown.

Obs. The closely allied species, *H. nisicolor* of Hodgson, from the Himalayas, may, Mr. Hume writes, be distinguished from the present by the young not having any barring on the flanks or abdomen, and also by its darker upper surface at all stages. It is, however, not likely ever to occur in Ceylon, as the larger form, *H. sparverioides*, common in South India, and which even migrates to China, has not yet been detected in the island.

Distribution.—This noisy Cuckoo arrives on the shores of Ceylon about the beginning of November, and makes its way at once to the hills, taking up its abode in considerable numbers in the forests of the main range. It is common about Nuwara Elliya, Kandapolla, and the "plains" lying between the Sanatorium and Totapella. On the Horton Plains themselves it is no less numerous, frequenting the picturesque woods which dot this beautiful and lonely spot. Layard was the first to record it from Ceylon, and writes that he shot three specimens in the old Botanical Gardens at Kew, Colombo; these were evidently new arrivals. Mr. Holdsworth met with it, as I did, at Newara Elliya, at the beginning of the year, and Mr. Bligh procured it in Kotmalie in the month of November. He writes me that it is not uncommon in the Haputale range, and that it was yearly to be found on the Harangolla patnas in considerable numbers, making itself heard by night as well as by day. Messrs. Whyte and Co. have lately sent home a specimen killed in the Kandy district, and I have no doubt it takes up its seasonal quarters on the slopes of the Knuckles range.

On the mainland the Hawk-Cuckoo is, says Jerdon, the common species "of the plains of India, being found throughout the whole country, though most abundant in wooded districts." Mr. Bourdillon writes of it that it is abundant in the semicultivated land of the plains of Travancore, penetrating the jungles at the foot of the hills to 1000 feet elevation, but that it does not ascend the hill-slopes to any height, though common in the low country. Mr. Fairbank's experience of it in the Palani hills is similar; he found it at the base and on the sides of the range only; it is singular, therefore, that it should resort to the very highest points in Ceylon. In Khandala it is common; and concerning its distribution in Chota Nagpur, Mr. Ball says that it is found in the jungly parts of the Province and that it inhabits the Rajmahal hills. In Jaipur and the south of Raipur, he remarks that it occurs in such abundance that its cry is a "positive nuisance and source of irritation both by day and night!" More towards the north-west of India it appears to be only a seasonal visitant; for Capt. Butler, in his very complete list of animal migrations to the Mount-Aboo district ('Stray Feathers,' 1877), records it as only remaining during the rainy monsoon—to wit, from June until October.

Habits.—Unlike many of the Cuckoos, which are silent in the non-breeding season, the present species is extremely noisy at all times; it frequents the high jungle in the upper ranges of the Ceylon hills, and is partial to the vicinity of the open grassy spaces called "plains" on the Nuwara-Elliya plateau. Its singular scale-like call, which is uttered while the bird twists its head round, is very characteristic of this region. In January it may be heard the whole morning in the picturesque woods on the Horton Plains, literally throwing its peculiar high-pitched notes in all directions: at one moment they seem to be in the distance; at the next, when it turns its head towards the listener, they swell with strange force on the ear, mounting higher and higher until the bird appears to be obliged to stop.

Jerdon writes of it as follows:—"It frequents gardens, avenues, groves, and jungles, and its loud crescendo

notes are to be heard in the breeding-season, from April till July in the south of India (but beginning earlier in Bengal, according to Blyth), in every garden or avenue. It sounds something like *pibuba, pibuba,* repeated several times, each time in a higher note than the last, till they become exceedingly loud and shrill. Mr. Elliott makes it *whi-wheeba*; Sundevall calls it *piripiu.* This author further remarks that each word is pronounced about twice, nearly in this manner in the musical scale, C B B A—A C C B—B D D C; and it thus mounts the scale of notes at every second cry, three or four times, till the note is as high as the bird can raise it, when it makes a short pause and begins anew. . . . . . . It lives both on caterpillars and other soft insects and on fruits, and it is very fond of the fig of the banyan and other *Fici.*" It is said by the natives in India to be good eating; but Mr. Fairbank says that he tried it, and found the flesh intolerably strong-flavoured, which is not to be wondered at, as, according to his investigations, it feeds on lizards and insects. Its flight is strong and swift, and it has been noticed to have the habit of darting suddenly into bushes, to the manifest alarm of small birds, who sometimes mistake it for the Shikra and pursue it accordingly. Mr. Bligh informs me that it calls at night; he found it frequenting the skirts of the jungle bordering the grassy wastes on the Harangolla patnas.

Nidification.—The eggs of this species have not yet been identified, as far as I have been able to ascertain. It is believed to deposit them in the nests of the *Malacocerci,* or Babblers. Jerdon saw these birds feeding a young one, which was following them about screaming; he writes that, "on one occasion, at least, there were two or three young *Malacocerci* in company; so that the young of this species of Cuckoo does not always eject the young of its foster-parent from the nest."

Genus SURNICULUS.

Bill much as in *Cuculus*, the nostrils very protuberant and situated near the margin. Wings moderate, with the 3rd and 4th quills subequal and longest. *Tail forked*, with outer feathers short, and the penultimate the longest and forming the fork. Tibial plumes very long. Tarsus partly feathered down the exterior side.

SURNICULUS LUGUBRIS.

(THE DRONGO-CUCKOO.)

Cuculus lugubris, Horsf. Trans. Linn. Soc. 1820, xiii. p. 179 (Java).
Cuculus albopunctatus, Drap. Dict. Class. d'Hist. Nat. iv. p. 570 (1823), juv.
Pseudornis lugubris, Hodgs. J. A. S. B. 1839, p. 137.
Pseudornis dicruroides, Hodgs. J. A. S. B. 1859, p. 136 (Mountains of Nipaul).
Cuculus dicruroides, Jerd. Cat. B. S. India, Madr. Journ. 1840, xi. p. 221; Layard et Kelaart, Cat. Prodromus, App. p. 60 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 453.
Surniculus dicruroides, Blyth, Cat. B. Mus. A. S. B. p. 72 (1849); Horsfield & Moore, Cat. B. Mus. E. I. Co. ii. p. 695 (1856); Jerdon, B. of Ind. i. p. 336 (1862); Swinhoe, Cat. B. of China, P. Z S. 1871, p. 394; Holdsworth, P. Z. S. 1872, p. 431; David & Oust. Ois. de la Chine, p. 61 (1877).
Cacangelus lugubris, Cab. et Heine, Mus. Hein. iv. p. 17 (1862).
Surniculus lugubris, Walden, Ibis, 1872, p. 368.
The Fork-tailed Cuckoo, Europeans in Ceylon; *The Black Fork-tailed Cuckoo*, Jerdon *The Fork-tailed Drongo-Cuckoo*, Blyth.
Kurrioviyum, Lepchas (Jerdon); *Awon-Awon*, Java.

Adult male and female. Length 10·0 to 10·3 inches; wing 4·8 to 5·3; tail 5·4 to 5·7 (to tip of penultimate), middle feathers about 1·5 shorter; tarsus 0·55 to 0·65; anterior toe 0·6, claw (straight) 0·25; bill to gape 0·9 to 0·95.

Iris brown; bill black; gape and inside of mouth orange-red; legs and feet blackish or deep reddish black, the edges of the tarsal scales whitish; claws black.

Plumage above and beneath black, with a blue and a green gloss or sheen, brilliant above and subdued on the lower surface; the head and tail have the blue lustre the strongest, and the back and wings green (in some specimens there are one or two white feathers on the occiput); the lateral tail-feathers are tipped and crossed with slanting bars of white, the penultimate has a series of white spots adjacent to the shaft, and all the rectrices a fine whitish edge at the base; the under tail-coverts, which are glossed more highly than the breast, are tipped and banded with white, and there is a conspicuous white tuft on the outer thigh-coverts.

Young. Iris red-brown; legs paler than the adult. In the first plumage the upper and lower surface have white tips to the feathers; the wing-coverts and rectrices are similarly tipped, and some of the underlying upper tail-coverts are barred as well; the head, back, and wings are less glossed than the adult, and the under surface is brownish black; the tail is more barred, the penultimate being thus marked instead of spotted, and the next feather has a series of median white marks. In this stage the tail is rounded, the penultimate being shorter than the adjacent inlying feather.

With age the spots disappear from portions of the upper surface, remaining longest on the upper tail-coverts, and some

birds, not quite mature, have fine white tips to the wing- and upper tail-coverts, and a greyish-white edging to the under-surface feathers.

Obs. The Indian species, *S. dicruroides* of Hodgson (which was described from a specimen from "the mountains" in Nepal), has generally been kept distinct from the much earlier described and reputedly smaller Javan species, *S. lugubris*. I notice, however, that so high an authority as Lord Tweeddale remarks (*loc. cit.*) that "Himalayan, Ceylon, Malaccan, and Javan individuals do not differ," and are all the same as an example from Borneo, which is the subject of his notes. It appears to be a very variable species as regards size. The wings of two adults from Java, as given in the note in question, measure 5·75 and 4·82 inches, one from Nepal 5·37, one from Darjiling 5·75. I have examined a good series of Ceylonese examples and have found none to exceed the limit given above (5·3), and the usual dimension is from 5·0 to 5·1 in fully adult black birds.

Distribution.—This singular Cuckoo is rather locally dispersed in Ceylon, being common in one district and absent in another adjacent tract of country. As regards the Western Province, it is occasionally found not far from Colombo, and is very common in the Three Korales and country intermediate between that and Ratnapura, and it extends into the hills, above the latter place, to a moderate elevation, occurring at Gillymally. In the south-west it is less frequent; in the Kurunegala and Puttalam district it is fairly represented, and it occurs here and there throughout the northern forest-tract at all times of the year, from the latter place across to Trincomalie, where it is not uncommon in the forests. In the Eastern Province I saw many examples, but did not meet with it in the Kattregama and Hambantota districts. In Madulsima and Uva I have seen it up to 4000 feet elevation, and procured it once near the Debedde gap; in the Kandy country it is found towards the Hangerankette side and in Dumbara valley. Layard mentions, in his notes, that Mr. Thwaites sent him numerous specimens from the neighbourhood of Kandy; it is probably more plentiful there some seasons than others.

In India it is sparingly distributed throughout the country. Jerdon writes, "I have procured it on the Malabar coast, the Wynaad, in Central India, and at Darjiling. I have found it in other parts of the Himalayas, ... and in Tenasserim and Burmah." Mr. Hume records it as rare in Tenasserim. It has been procured in different parts of the Malaccan peninsula and in Sumatra at Lampong, and, as above noticed, was first described from Java, where, according to Horsfield, it is found "in districts of secondary elevation, which are diversified with extended ranges of hills and covered with luxuriant forests." To the east of that island it has been found in Labuan and Borneo; and Mr. Swinhoe remarks that it was procured by him in Szechuen, China, in the month of May. In India, judging by the experience of collectors recently, it is less common than in Ceylon.

Habits.—The Fork-tailed Cuckoo frequents a variety of situations, inhabiting the interior of dry forests throughout the north, scrub and low jungle in other places, grassy patnas dotted with isolated trees, and last, but not least, burnt clearings and vegetable plantations in the woods of the interior. In the latter it is chiefly observed in Saffragam and at the base of the western ranges, delighting in perching on the charred stumps and saplings which remain after the first firing of a cheena. It is exceedingly docile in its disposition, sometimes alighting on a fence by the side of a jungle-path and flying tamely on in front of the traveller, and at others sitting on a stump until approached within a few yards. At a distance, its tame habit will always serve, in conjunction with its small-looking head and bill, to distinguish it from a Drongo, to which it bears an otherwise absolute resemblance. Its remarkably human-like whistle, which consists of six ascending notes (sounding as if some one were practising a musical scale in the wilds of the jungle), is, I think, uttered chiefly in the breeding-season. I have heard it always in the north during the north-east monsoon; at other times, in July and August, in the Western Province, it is quite mute. Its diet is mixed, consisting chiefly of caterpillars and beetles, but often combined with various seeds.

When on the wing it is very different from a Drongo, flying along with a steady movement, and not dipping in its progress through the air.

Nidification.—Judging from my examination of various specimens shot in the north, the breeding-season of this species appears to be in the early part of the year; it is most noisy then. I have no information as to

its eggs, or the bird in whose nest they are deposited. Jerdon suggests that it may possibly lay in those of King-Crows, to which it bears such a wonderful resemblance. He writes, "One day, in Upper Burmah, I saw a King-Crow pursuing what at first I believed to be another of his own species; but a peculiar call that the pursued bird was uttering, and some white on his plumage, led me to suppose that it was a Drongo-Cuckoo, which had perhaps been detected about the nest of the *Dicrurus*. Mr. Blyth relates that he obtained a pure white egg in the same nest with four eggs of *D. macrocercus*, and which, he remarks, may have been that of the Drongo-Cuckoo." It is extremely probable, I think, that it was.

Genus COCCYSTES.

Head crested. Bill more curved and compressed than in the preceding genera. Nostrils ovate, basal, exposed, and placed near the margin. Wings rather short, rounded, the 4th quill the longest. Tail long, much graduated. Tarsus longer than in *Cuculus*, exceeding the inner anterior toe; the upper portion feathered, the rest covered with broad transverse scales; outer posterior toe considerably longer than the inner one.

COCCYSTES JACOBINUS.

(THE PIED CRESTED CUCKOO.)

Cuculus jacobinus, Bodd. Tabl. Pl. Enl. 872 (1783).

Cuculus melanoleucos, Gm. Syst. Nat. i. no. 35, p. 416 (1788); Lath. Ind. Orn. i. p. 211 (1790).

Oxylophus edolius, Jerd. (*nec* Cuv.) Cat. B. S. India, Madr. Journ. 1840, xi. p. 222.

Oxylophus melanoleucos, Blyth, Cat. B. Mus. A. S. B. p. 74 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 451.

Oxylophus serratus, Kelaart, Prodromus, Cat. p. 128 (1852).

Coccystes melanoleucos, Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 694 (1856); Jerdon, B. of Ind. i. p. 339.

Coccystes jacobinus, Cab. et Heine, Mus. Hein. iv. p. 45 (1862); Holdsworth, P. Z. S. 1872, p. 432; Hume, Nests and Eggs (Rough Draft), p. 137 (1873); Sharpe, P. Z. S. 1873, p. 597; Legge, Str. Feath. 1874, p. 366; Ball, ibid. p. 394; Butler, ibid. 1875, p. 461; Legge, Ibis, 1875, p. 284; Morgan, ibid. 1875, p. 315; Hume, Str. Feath. 1876, p. 457.

Jacobin huppé de Coromandel, Daubent. Pl. Enl. pl. 872; *The Pied Cuckoo*, in India; *Popiya*, Hind., also *Chatak*; *Kola Bulbul*, Bengal.; *Gola kokila*, lit. "Milkman Cuckoo," also *Tangada gorankah*, Telugu (Jerdon).

Konde koha, lit. "Crested Cuckoo," Sinhalese.

Adult male and female. Length 12·0 to 13·0 inches; wing 6·4 to 6·7; tail 5·4 to 5·5; tarsus 1·0; outer anterior toe 0·8, its claw (straight) 0·3; bill to gape 1·1.

Iris dark brown; bill black; legs and feet bluish slate, edges of scales whitish, claws blackish.

Head, cheeks, upper surface, tail, and wings glossy green-black, the crown-feathers lanceolate and rather stiff, forming a fine crest one inch in length; quills dull black; basal half of primaries, with the exception of that part of the outer web of the 1st and inner web of the last, white; central rectrices tipped white, and the terminal ½ inch of the rest the same hue; entire under surface and under wing-coverts sullied white, which passes up behind the ear-coverts on to the sides of the neck; greater lower primary-coverts blackish.

Young. Birds of the year have the bill pale at the base; the legs and feet paler than the adults. The upper surface is sepia-brown, with the nape, ear-coverts, and sides of neck blackish; the forehead paler than the head, and the lesser wing-coverts are edged with greyish; beneath fulvous-grey or buff-white, with the sides of the throat brownish from the chin to below the ear-coverts.

Obs. An individual from the hills in the north-west of India measures—wing 5·7 inches, tail 6·8, bill to gape 1·3

another from Pegu, wing 5·9: both are identical with Ceylonese examples. Mr. Sharpe unites the African species with the Indian. A specimen from Damara Land, described by him *loc. cit.*, had the wing 6·4 and the tail 8·0 inches.

Distribution.—The Pied Cuckoo, which is a showy species, is widely distributed over the low country of Ceylon, but is subject to a partial migration away from the wet regions on the western and south-western sea-board during the prevalence of the S.W. monsoon. It appears about Colombo in November and December, and, when first arrived, lurks in any thick cover that may be to hand. I have seen it in the trees on the borders of the Slave-Island lake, but it soon disappeared for the jungles of the interior. In the Galle district it arrives about the same time and frequents the low jungle in the cultivated portions of the country. In the scrubby jungles of the Girawa and Magam Pattus and throughout the Eastern Province, in the jungles between the Mahawelliganga and the coast, in the maritime portions of the north and west, as far south as Chilaw it is a resident species, and in some of these districts is abundant. It is partial to those dry districts which are covered with low scrub, such as the neighbourhood of Hambantota and many similar spots on the east coast, the Jaffna peninsula, the N.W. coast, and the island of Manaar, as also the Puttalam and Chilaw district. I have seen it occasionally in the interior of the northern division of the island, but it is scarcer there than in the maritime portion. It ranges into the Central Province to a considerable elevation, occurring in Uva up to 3000 feet; but in the western portions (to wit, the valley of Dumbara and adjacent districts) it is not found at such an altitude.

This Cuckoo enjoys a wide range on the main land. Jerdon sketches out its distribution as follows:—"It is found all over India, being rare on the Malabar coast, common in the Carnatic, and not uncommon throughout Central India to Bengal, where it is only at all common in the rains. It is more abundant in Upper Pegu than anywhere else that I have observed it . . . . I have seen it on the Nilghiris up to 5000 feet."

It does not appear to be found on the hills of the peninsula, but is common in the low country, on the Madura coast, and in Ramisserum Island. In Chota Nagpur it occurs rarely, as also in the Sambhur district. As regards Mount Aboo and Northern Guzerat, Captain Butler says it is very common, arriving just before the monsoon. In Cachar, Mr. Inglis met with it but once, and that was in May; but in Upper Pegu I find that Captain Butler and Mr. Oates corroborate Jerdon in saying that it is common; further south I observe that it has not been actually procured in Tenasserim, though it is doubtfully included in Mr. Hume's first list of birds from that Province. In North-east Africa it is, according to Mr. Sharpe, probably a migrant, and has been found in various parts of that region from August to November. Mr. Blanford has procured it in the Anseba valley, Antinori on the Blue Nile, and Ehrenberg in Nubia. It has been met with on the east coast and in various parts of South Africa, in Natal, the Transvaal, and other localities, and in the south-west of the continent it has been obtained in Damara Land.

Habits.—Low scrub, thorny jungle round the edge of forest, and open plains dotted here and there with brush-wood are the localities chiefly frequented by this Cuckoo; but it now and then occurs in avenues of trees or isolated shady groves, particularly when newly arrived in a district and the first cover to hand is being eagerly sought after. It is tame and usually solitary, although now and then I have seen a pair together; and in Pegu Mr. Oates has observed five or six in company. It is commonly seen sitting on the top of a low bush, and when flushed takes a short flight, but does not seek concealment in the bushes to any great extent. It has a rather plaintive, not unmelodious call, uttered when perched on some low tree; but at the commencement of the breeding-season, Mr. Holdsworth writes, "they are very noisy and incessantly flying from one place to another, one or more males apparently chasing the female, and uttering their clamorous cries." Jerdon remarks the same fact, and says that the call which the males utter at this time "is a high-pitched metallic note."

Its diet is insectivorous, consisting of caterpillars and various larvæ, grasshoppers, Mantidæ, &c.

Nidification.—In Ceylon the Pied Crested Cuckoo lays its eggs during the N.E. monsoon, choosing the nest of the Mud-birds or Babblers (*Malacocercus*) to deposit them in. Mr. Holdsworth observed them fighting

with these birds at Aripu, and Layard records an instance at Port Pedro of a pair of these Babblers tending a young Crested Cuckoo in a bush; and when he drew near they flew away before him, feigning lameness, and endeavoured to draw off his attention from their fosterling. An egg taken from the oviduct of a female killed in the Puttalam district was of a pale greenish or faded greenish-blue colour, and measured 0·95 by 0·74 inch.

In Aboo, Captain Butler states that they chiefly lay in the nests of the Striated Bush-Babbler (*Chatarrhœa caudata*) and also in those of the Bengal Babbler (*Malacocercus terricolor*). The eggs are highly glossy and closely resemble, says Mr. Hume, those of the first-named species, so that they are well fitted for deposit in Babblers' nests; in shape they are "round ovals . . . very glossy, and of a delicate full sky-blue," and average 0·91 by 0·73 inch.

COCCYSTES COROMANDUS.

(THE RED-WINGED CRESTED CUCKOO.)

Cuculus coromandus, Linn. Syst. Nat. i. p. 171. no. 20 (1766); Lath. Ind. Orn. p. 216 (1790).

Cuculus collaris, Vieillot, N. Dict. d'Hist. Nat. viii. p. 229 (1816).

Oxylophus coromandus, Jerd. Cat. B. S. Ind., Madr. Journ. 1840, xi. p. 272; Blyth, J. A. S. B. 1842, p. 920; id. Cat. B. Mus. A. S. B. p. 74. no. 363 (1849); Kelaart, Prodromus, Cat. p. 128 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 451.

Coccystes coromandus, Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 693 (1856); Jerdon, B. of Ind. i. p. 341 (1862); Cab. et Heine, Mus. Hein. iv. p. 45 (1862); Holdsworth, P. Z. S. 1872, p. 432; Hume, Nests and Eggs (Rough Draft), p. 138 (1873); id. Stray Feath. 1875, p. 82; David & Oustalet, Ois. de la Chine, p. 61 (1877).

Coucou huppé de Coromandel, Buffon, Pl. Enl. p. 274; *Coromandel Cuckoo* of some; *The Collared Crested Cuckoo*, Kelaart.

Yerra gola Kohila, Telugu; *Tseben*, Lepchas (Jerdon).

Konde-koha, lit. "Crested Cuckoo," Sinhalese.

Adult male. Length 15·0 inches; wing 6·3; tail 9·3; tarsus 0·9; outer anterior toe 0·95, claw (straight) 0·35; bill to gape 1·3.

Adult female. Length 16 inches; wing 6·7; tail 9·7; bill to gape 1·4.

Iris hazel-brown; bill black, inside of mouth and nostrils coral-red; legs and feet bluish slate, claws black.

Above, the head, including the lores, upper part of cheeks and ear-coverts, the hind neck, back, scapulars, tertials, and least wing-coverts black, with a bronze-green lustre on the upper parts, and a deep blue-green gloss on the upper tail-coverts and tail; the head is less glossed than the back and crest, which latter is 1⅝ inch in length, and stands out boldly from the nape; the green of the tertials is paler or more overcast with a brownish lustre than other parts; a conspicuous collar of white across the hind neck; quills, greater and median wing-coverts rich chestnut, the primaries dusky towards the tips; tips of rectrices fulvous-white, the centre pair only edged with it; beneath, the throat, fore neck, and sides are yellowish ferruginous, paling into white on the breast and upper part of belly, the abdomen, vent, and thigh-coverts becoming dusky grey; under tail-coverts green-black, edged with fulvous-white, some of the feathers having pale centres.

Female. Differs slightly; somewhat less deep in hue above; tips of rectrices whiter; throat not so rich, the colour not extending to the chest, and the lower part of breast not so pure, the grey of the abdomen pervading it somewhat.

Young. In Hodgson's drawing of the "young, hardly fledged," the bill and eyelid are pale red; the iris is pale brown, and the legs and feet reddish fleshy.

Head, upper surface, and tail brown, the feathers of the head, back, rump, and scapulars with broad fulvous margins; the quills and wing-coverts more deeply margined with the same; tail-feathers edged outwardly and tipped with pale rufous; ear-coverts and entire under surface white.

The bird of the year has the green portions of the upper surface, including the upper tail-coverts, tipped and edged towards the extremities of the feathers with rufous, and the ground-colour brownish metallic green; throat whitish, washed with yellowish rufous; under tail-coverts and abdomen tipped with ferruginous.

Distribution.—The Red-winged Crested Cuckoo, one of the handsomest of its tribe in Ceylon, is a migratory bird to the island, arriving about October and departing again in April. Whether or not it leaves the extreme north of the island altogether, I have been unable to ascertain with certainty; but there is no question about its being a visitor to the southern parts of the west coast, for in October 1876, while I was at

Colombo, an individual was captured on a canoe, some miles from the coast, and on which it had alighted in an exhausted state. When it first arrives it is not unfrequently seen in the Western Province, and then disappears from the sea-board, taking up its quarters in the interior of the low country and ascending the hills to some altitude. It occurs sometimes in Dumbara, and in March 1877 Mr. Bligh saw an example near his bungalow on the Catton Estate at an elevation of more than 4000 feet; he informs me that they are very rare in the Haputale district, and, indeed, its numbers throughout the island are very limited. The island of Manaar and the adjoining coast may perhaps be considered an exception; in the former I saw a good many in March, and Mr. Simpson says it is found about Illepekadua, and in the interior between that place and Mahintale. Mr. Holdsworth does not record it from Aripu. Layard procured it at Ratnapura.

On the mainland the Coromandel Cuckoo enjoys a wide range, but seems to be nowhere numerous. Jerdon writes of its distribution:—"It appears to be a rare species everywhere, though generally spread through India and Ceylon, extending into Burmah and Malayana. It is said to be common in Tenasserim and the Malayan peninsula. I have seen it in Malabar and the Carnatic, and it is also found in Central India and not very uncommonly in Bengal; in the latter country only during the rains. I obtained it in Sikhim in the warmer valleys."

It has been procured by very few collectors of late years either in South or Central India. I find no record of it in 'Stray Feathers' from the Peninsula; but I am aware that it is not uncommon in Ramisserum Island, having received specimens from there, and it must consequently be found on the adjacent coast about Tuticorin. Concerning its range to the east of the Bay of Bengal, Mr. Oates writes that in Pegu it is widely distributed, but not common. Captain Feilden seems to have fallen in with it to a much greater extent; he says:—"This bird is the commonest Cuckoo at Thayetmyo; in the thicker parts of the jungle every bamboo valley contains one or more pairs. They arrive in the beginning of the rains, and the young birds do not leave until October." This is the period at which the species visits us in Ceylon, so that there would appear to be a regular migration north and south at the beginning and end of the rains. In Tenasserim Mr. Davison only found it at a place called Meeta myo, which is about the centre of the province. There is a specimen in the British Museum from Sarawak; it goes, as we know, to Celebes, and it probably occurs in intermediate localities, perhaps in Java, but from there I have not heard as yet of any specimens. It is very desirable that we should know more of the movements and seasonal distribution of this bird, as it is one of the most attractive of its tribe in India. Swinhoe procured it at Amoy.

Habits.—I have observed this species in thick scrub and thorny jungle. A specimen was shot by Mr. MacVicar in the cinnamon-gardens near Colombo, a locality decidedly favourable to its habits. It is very shy, flying quickly up from the ground on being surprised, alighting then on the nearest bush or low tree, and speedily threading its way through the branches to the other side, when it again takes wing. The stomachs of those I have procured contained beetles, grasshoppers, Mantidæ, and other large insects. Captain Feilden notices that they have a Magpie-like chatter usually, but that they utter a "harsh, grating, whistling scream when watching over their young;" and this, I imagine, would be their ordinary note of alarm.

Nidification.—The breeding-season appears to be during the rains, *i. e.* from June until October. Mr. Hume describes an egg, which was taken from the oviduct of a female shot in Tipperah, as being a broad oval and of a "fine and glossy texture; in colour it was a moderately pale, somewhat greenish blue, without any specks or spots."

Captain Feilden has reason to believe that it lays in the nests of Quaker-Thrushes (*Alcippe phayrei*?). He writes, "I have frequently shot the young bird from the middle of a brood of young Quaker-Thrushes; and, as far as I could see from the thickness of the jungle, the old Thrushes were feeding the young Cuckoo. An egg taken from the nest of a Quaker-Thrush, that I believe to have belonged to this bird, was very round and pale blue."

The dimensions of the egg alluded to above are 1·05 by 0·92 inch.

Genus EUDYNAMYS.

Bill stout, wide at the base, not so much compressed as in *Coccystes*. Nostrils oval, exposed, not so near the margin as in the last. Wings long; the 3rd and 4th quills subequal and longest, the 1st nearly equal to the innermost. Tail not so much graduated as in the last genus. Legs and feet stout. Tarsus about equal to the anterior toe, and shielded with stout, broad, transverse scutæ.

EUDYNAMYS HONORATA.

(THE INDIAN KOEL.)

Cuculus honoratus, Linn. Syst. Nat. i. p. 169 (female) (1766); Lath. Ind. Orn. i. p. 214 (1790).

Cuculus niger, Linn. Syst. Nat. i. p. 170. no. 12 (male) (1766).

Cuculus indicus, Lath. Ind. Orn. i. p. 221 (1790).

Eudynamys orientalis, Sykes (*nec* Linn.), P. Z. S. 1832, p. 97; Jerd. Cat. B. S. India, Madr. Journ. 1840, xi. p. 222; Blyth, J. A. S. B. 1847, p. 468; id. Ann. & Mag. Nat. Hist. 1847, p. 385; id. Cat. B. Mus. A. S. B. p. 73 (1849); Kelaart, Prodromus, Cat. p. 129 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 451; Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 708 (1856); Jerdon, B. of Ind. i. p. 342; Irby, Ibis, 1861, p. 230; Legge, ibid. 1874, p. 16.

Cuculus (Eudynamys) honoratus, Blyth, J. A. S. B. 1842, p. 912 (female).

Eudynamys honoratus, Gray, Gen. Birds, ii. p. 464 (1845).

Eudynamys honorata, Walden, Ibis, 1869, p. 327; Holdsworth, P. Z. S. 1872, p. 432; Hume, Nests and Eggs (Rough Draft), p. 139 (1873); Ball, Str. Feath. 1874, p. 394; Anderson, Ibis, 1875, p. 142; Hume, Str. Feath. 1876, p. 463.

Eudynamys horonata, Hume, Str. Feath. 1873, p. 173.

The Black Indian Cuckow, Edwards, Nat. Hist. Birds, p. 58 (male); *Brown and Spotted Indian Cuckow*, Edwards, *tom. cit.* p. 59 (female); *Coucou tacheté de Bengal*, Daubent. Pl. Enl. pl. 294 (female); *Black Cuckoo* of some; *Koel*, Hind. (female), sometimes *Koreyala*, lit. "spotted"; *Kokil*, Bengal.; *Kokila*, Tel. (male *Nalak*, female *Podak*).

Kaputa koha (male), *Gomera koha* (female).

Coosil and *Koel*, Ceylonese Tamils (*apud* Layard).

Adult male. Length 15·0 to 15·3 inches; wing 7·0 to 7·4; tail 7·0 to 7·5; tarsus 1·15 to 1·2; outer anterior toe 1·25, its claw (straight) 0·45; bill to gape 1·55.

Iris crimson; bill pale bluish green, blackish or dusky round the nostrils; legs and feet leaden blue.

Entire plumage black, with a strong metallic green lustre; the scapulars, wing-coverts, and tail with a bluish sheen as well.

Adult female. Length 15·5 to 16·5 inches; wing 7·3 to 7·75; tail 7·8; tarsus 1·25; outer anterior toe 1·3, claw (straight) 0·45.

Iris red; bill faded bluish, dusky at base and round the nostrils; legs and feet dusky slaty green or faded bluish.

Above metallic brownish green; hind neck, back, and lesser wing-coverts spotted and barred with white, the markings on the first-named part are limited to spots, and the barring on the wing-coverts consists of interrupted bar-like spots; the wings vary considerably in the character of their markings; quills, upper tail-coverts, and tail

barred with white, tinged generally to a greater or less extent with fulvous; forehead marked with fulvous terminal spots or broad mesial stripes; beneath white, with basal or longitudinal blackish marks on the throat, angular or arrow-headed on the chest, gradually changing into wavy bars on the breast; the flanks and the under tail-coverts boldly barred with dark greenish brown: the lower parts from the breast downwards more or less washed with fulvous.

Young. Males in nestling plumage have the iris mottled red; bill greenish, dusky at the base; legs and feet plumbeous. Upper surface and wing-coverts dingy or brownish metallic green, the feathers with white terminal spots: under surface the same, with terminal bars of white; under tail-coverts and under wing-coverts barred with white; tail-feathers tipped and adjacently marked with whitish.

The female in immature plumage has the head, hind neck and its sides, face, and throat striated with rufous; the spottings on the back and wing-coverts, and the bars on the scapulars and tertials, tinged strongly with the same; the bars on the tail-feathers rich tawny, and the under surface washed with the same.

Young females vary in their coloration, as, in fact, the adults also do; scarcely any two female Koels are marked *exactly* alike, differing in the extent of the spotting and barring of the upper surface, and in the amount of rufous on the forehead, of which our birds seem to have more than Indian.

Obs. A comparison of a series of Indian examples with my Ceylonese specimens does not disclose any points of difference between the two races except in the above-mentioned respect. A male from Madras has the wing 7·2 inches, and is identical with examples in my collection; another from Central India is larger, wing 7·8 inches.

The several species of Koel which inhabit the region to the east of the Bay of Bengal and the Malayan archipelago are closely allied, the males being black, and the chief specific difference lying in the coloration of the females.

E. malayana, Cab. et Heine, from Assam, Burmah, Tenasserim, Malacca, and Sumatra, has a larger bill than our bird, is longer in the wing, and the females are boldly marked with rufous. I have measured examples in the national collection varying from 7·4 to 7·6 inches in the wing, but it is said to reach 8·0 inches.

E. ransomi, from Ceram and Bouru, is a very fine species, with the wing 8·6 to 9·0 inches, tail 8·0 to 9·0, bill to gape 1·4; the female is very handsomely marked, its coloration being likewise rufous.

E. orientalis. An example, male, from Lombok has the wing 8·1 inches: a female is greenish black, barred with fulvous and white; the forehead and a superciliary band yellowish rufous, centre of the crown dusky green; wings and tail barred with rufous: another female is rufous beneath, barred with black; the upper surface dark green, barred with black.

Distribution.—The Koel is found all over the low country. It is equally common in the northern and southern portions of the island, including the Jaffna peninsula. Mr. Holdsworth only observed it at Aripu from November till April, and inferred that it was migratory to Ceylon. It moves about a good deal according to the weather, leaving the sea-board of the Western Province for the interior during the wet windy months from May until October; but this is all: away from the sea I have seen it at all seasons. On the east side of the island it appears to be stationary, being at all times to be observed in that part; and this is likewise true of the north-east. It is numerous in the delta of the Mahawelliganga and on the coast in places to the north of Trincomalie. In the interior it is much rarer, and, in fact, is liable to be passed over in a cursory inspection of many parts of the northern half of the island, as it is local in its distribution there. I have not seen it from the hills, but have been given to understand that it has occurred in Dumbara.

On the continent this noisy bird is very common in most parts of the Indian peninsula. It is abundant in Ramisserum Island and on the south coast of India; in the Palani hills it likewise occurs; in the Deccan it is common and widely distributed. Mr. Ball says it is tolerably common in the eastern parts of Chota Nagpur, but is seldom met with in the western, more jungly districts. Further to the west it appears to be a visitant only in the breeding-season, from April until October. Mr. Adam remarks that during his stay at Sambhur it only visited the place once or twice during the rains; in Sindh it is likewise non-resident, and in the Mount-Aboo district it occurs during the above-mentioned period of the year. Its inhabiting the Laccadive islands is especially worthy of remark. Mr. Hume found it on every inhabited island that he visited; he writes that, "unless perhaps at Amini and one or two of the Cannanore Islands, where there are Crows, they can only be, as the people affirm, seasonal visitants, there being no bird in whose nests they could lay their eggs."

Habits.—This is one of the noisiest birds in Ceylon, making the woods and paddy-fields ring with its

peculiar scale-like call. It frequents groves of trees, compounds, wooded knolls in paddy-fields, and jungle near water or bordering open ground. It is a skulking bird, loving concealment in thick trees and tangled bushes, and delighting in the shady foliage of trees which are matted at the top with creepers. It moves actively about when flushed and driven into a tree, hopping along the slanting limbs, and springing from branch to branch till it gains the other side, and then escapes to a further place of concealment. It is the male which utters the peculiar note *ku-il, ku-il,* or *koyo koyo,* which mounts each time higher and higher and increases in vigour until it fairly rings through the woods; he is usually perched in some thick tree, and when he has finished his vociferation one or two females may be seen issuing from their places of concealment and flying towards him. This cry may often be heard at night. Adult males seem usually to be in the minority, or else they do not move about as much as the other sex, many more of which may always be seen in the course of a day's ramble.

The Koel is almost exclusively a fruit-eating species, and feeds greedily on all sorts of luscious seeds and berries; from the stomach of a male I once took two entire nuts of the Kitool-palm: it is fond of the banyan-fruit, but in Ceylon does not much affect localities in which this tree grows. Blyth states that it ejects the large seeds of any fruit that it has eaten by the mouth: he syllabizes another note uttered by the male as *ho-whu-ho*; but I have not heard this. Both sexes are much more noisy in May and June than at other times, as this is the breeding-season in Ceylon.

Layard remarks that the natives so much admire the note of this bird, that their poets compare it to the voices of their mistresses, which, however, as he aptly continues, cannot be very soft, for the Koel can be heard a mile away!

Nidification.—In the Western Province this parasitic Cuckoo breeds in May and June, laying nearly always in the nest of *Corvus levaillanti* (the Black Crow), and not in that of the smaller citizen species, as in India, for the simple reason that the latter does not inhabit the jungle to which the Koel resorts to rear its young. I am indebted to Mr. MacVicar for many valuable notes on the nesting of this bird, a number of whose eggs he has taken in the Western Province, and more especially in the vicinity of Kæsbawa. The following are the particulars of four nests found in the months of May and June, 1875:—

(1) Eggs: 4 Crow's; 4 Koel's.

Differed considerably, as if they had been laid by different birds. Two were of a pale green ground, spotted rather thickly with longitudinally-directed markings of olive-brown, confluent slightly round the obtuse end, and laid over numerous blotches of lilac or pale bluish grey: dimensions, 1·24 by 0·93 inch and 1·2 by 0·9 inch. The other two were of a light brown colour, covered with small reddish-brown and purple spots: dimensions, 1·35 by 1·1 inch and 1·34 by 1·0 inch.

(2) Eggs: 5 Crow's; 3 Koel's.

Ground-colour olivaceous green, blotched and marked (sparingly at the small end) with two shades of olive-brown over numerous smaller spottings of indistinct bluish grey; the markings almost confluent at the obtuse end.

(3) Eggs: 2 Crow's; 4 Koel's.

Two distinct types. Ground-colour of two olive-brownish grey, marked all over, but mostly at the large end, with reddish brown, over numerous smaller spots of bluish grey; at the obtuse end the spots are large, but all over the rest of the surface in the form of small specks: dimensions, 1·32 by 1·0 and 1·38 by 1·0. The other two were of a greenish ground-colour, speckled with purplish and brown spots, mostly towards the obtuse end, where the markings become confluent: dimensions, 1·36 by 0·95 inch and 1·25 by 0·96 inch.

(4) Eggs: 2 Crow's; 2 Koel's.

In shape very stumpy. Colour dark olive-green, spotted with dark reddish brown, confluent round the obtuse end. Dimensions, 1·18 by 0·92 inch and 1·15 by 0·95 inch.

The average size of these eggs was 1·31 by 0·95 inch.

In India the Black Crow lays too early for the Koel; and my lamented friend Mr. Anderson* remarks

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* In Mr. Hume's 'Nests and Eggs of Indian Birds' will be found a lengthy extract from a paper by this observant naturalist on the nesting of the Koel.

that this is why the nest of the Common Grey Crow is chosen. These clever birds seem to know that they are imposed upon by the Koels, and consequently hold them in strong dislike, constantly attacking and pursuing them during the breeding-season. When the female Koel is about to intrude her egg into the Crow's nest she is accompanied sometimes by the male. It is supposed that the young Koel ejects the Crows from the nest, as in the case of the Common Cuckoo; for Mr. Hume found a young one in a nest with three Crows newly fledged, and a week later "the Crows were missing, and the young Cuckoo thriving." The young Cuckoos persistently follow the Crows for some time after they have "flown," and are even then fed by them with as much care as if they were their own offspring.

Subfam. PHŒNICOPHAINÆ.

Bill robust, in most species higher than wide; culmen much curved. Nostrils not swollen and more or less linear. Tail long and graduated. Tarsi robust and naked, or slightly feathered on the upper part.

PHÆNICOPHAES PYRRHOCEPHALUS

PICARIÆ.

CUCULIDÆ.

PHŒNICOPHAINÆ.

Genus PHŒNICOPHAËS.

Bill stout, wide at the base, and suddenly compressed, the tip well bent down; the upper mandible very high: the nostrils linear and close to the margin, which is lobed just beneath them. Face clothed with a short papillose substance. Wings rounded; the 5th quill the longest and the 1st the shortest. Tail very long, broad, and much graduated. Tarsus longer than the middle toe and its claw, covered with broad transverse scales; outer anterior toe considerably longer than the outer posterior one; claws short and much curved. Feathers of the throat with stiff shafts projecting beyond the webs.

PHŒNICOPHAËS PYRRHOCEPHALUS.

(THE RED-FACED MALKOHA.)

(Peculiar to Ceylon.)

Cuculus pyrrhocephalus, Forster, Ind. Zoologie, p. 16, pl. vi. (1781); Gmelin, Syst. Nat. i. p. 417. no. 40 (1788); Lath. Ind. Orn. i. p. 222 (1790).

Phœnicophœus pyrrhocephalus, Stephens, Gen. Zool. ix. i. p. 59 (1825); Blyth, J. A. S. B. 1842, p. 927; Bonap. Consp. Gen. Av. i. p. 98 (1850).

Phœnicophaus leucogaster, Vieill. N. Dict. d'Hist. Nat. xviii. p. 461 (1816).

Melias pyrrhocephalus, Less. Traité d'Orn. p. 131 (1831).

Phœnicophaus pyrrhocephalus, Blyth, J. A. S. B. 1845, p. 199; Gray, Gen. Birds, ii. p. 459; Blyth, Cat. B. Mus. A. S. B. p. 75. no. 369 (1849); Kelaart, Prodromus, Cat. p. 129 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 453; Legge, J. A. S. (Ceyl. Br.) 1870–71, p. 37; Holdsworth, P. Z. S. 1872, p. 433; Legge, Str. Feath. 1873, p. 346; id. Ibis, 1874, p. 16, et 1875, p. 285.

Phœnicophaus ceylonensis, Licht. in Mus. Berl.

Phœnicophaës pyrrhocephalus, Cab. et Heine, Mus. Hein. pt. iv. p. 68 (1862).

The Red-faced Cuckoo (*rothköpfige Kukkuk*), Forster; *Malkoha*, Pennant and Kelaart.

Mal-kœndetta, Sinhalese, Western Province; *Warrelliya*, in Friars-Hood district.

♂ suprà metallicè viridis, alis dorso concoloribus, primariis extùs vix cyanescentibus: rectricibus olivascenti-viridibus, latè albo terminatis: pileo colloque postico nigricantibus, plumis albido marginatis, quasi striolatis: facie laterali totâ nudâ, papillosâ, rubrâ: genis et regione paroticâ, mento gulâque summâ striolatim albis: gutture reliquo nigro: præpectore et colli lateribus nigris albido striatis: corpore reliquo subtùs albo: tibiis fuscescenti-viridibus: subalaribus metallicè chalybeo-viridibus, remigibus quoque subtùs chalybeo nitentibus: rostro flavicanti-viridi, mandibulâ pallidiore: pedibus cyanescenti-schistaceis, unguibus brunnescenti-corneis: iride brunneâ.

♀ mari similis, sed iride albâ distinguenda.

Adult male. Length 17·8 to 18·2 inches; wing 6·0 to 6·2; tail 10·5 to 11·1 (lateral feathers only 5); tarsus 1·3 to 1·4; anterior toe 1·1, claw (straight) 0·35; bill to gape 1·5 to 1·6. Expanse 17·5.

Iris brown; bill apple-green, paling at the tip, and the lower mandible lighter than the upper; legs and feet bluish slate, claws brownish horn.

Female. Length 18·0 to 18·7 inches; wing 6·2 to 6·4; tail 11·0 to 11·3; bill to gape 1·5 to 1·65.

Iris white.

Whole face as far back as the ears, passing over the eye and across the base of the upper mandible, clothed with a short blade-like crimson substance, resembling a rudimentary feather; crown, back, and sides of neck greenish black, with the terminal margins of the feathers white; back and wings deep brilliant metallic green, blending into the hue of the neck; quills slightly darker, with a bluish lustre; tail metallic bronze-green, the terminal portion white, increasing from about an inch on the central feathers to two inches on the laterals, and separated from the green by a smoky-brown margin; throat and upper part of chest deep black, the feathers of the chin and of the space beneath the crimson cheeks white, with black shafts; breast and lower parts pure white, changing abruptly from the black of the chest, at the lower edge of which the feathers are tipped with white; flanks and thighs dark greenish black; under wing-coverts metallic green. The tips of the head- and neck-feathers are furcate, the shaft protruding from the fork.

The extent of the striations on the hind neck, and the amount of white tipping at the edge of the black chest, vary in individuals. Some examples, probably immature birds, have the thigh-coverts and lower flanks tinged with fulvous.

Obs. This remarkable genus has no representative in India. Jerdon speaks of *Ph. curvirostris*, an inhabitant of Burmah; but this bird has a very different shaped and situated nostril, on account of which Mr. Sharpe, and justly so it would appear, has made it into a new genus, *Rhinococcyx*. It has the same singular facial clothing, but not to so great an extent as in our bird.

The most singular feature in the economy of the present species is the difference in the colour of the eye in the two sexes, as noticed in my description above. Layard probably procured a female and noted the colour as white; specimens sent to Lord Tweeddale, and a living bird which Mr. Holdsworth had, appear to have been males and had brown eyes. I was fortunate enough, on two occasions, to shoot a pair together, and was able to demonstrate the fact of the sexual difference.

Distribution.—The Malkoha is found in most of the forests and heavily-clad jungle-districts of the low country; but, notwithstanding, has always been considered one of our rarest species, an idea which naturally arose from the extreme difficulty of penetrating its haunts. It occurs sparingly throughout the south-western hill-region, or the tract of country extending from the Kaluganga, through the Pasdun and Hinedun Korales, to the eastern confines of the Morowak Korale. It is likewise to be found in most of the damp forests of the Western Province, particularly in the hills stretching from the neighbourhood of Avisawella to Kurunegala, and occurs even at Mahara and Kotté, in the vicinity of Colombo. It occurs throughout the jungles of the great northern forest-tract, extending from the Western Province through the Seven Korales to the Vanni, the most northerly point in which I have seen it being the forests on the road from Trincomalie to Anaradjapura. In the Eastern Province, however, it is far more numerous than in the aforesaid districts, for I have met with it in flocks of ten or a dozen in the jungles at the base of the Friars Hood, and also near Bibile beneath the Madulsima range. Mr. Bligh has procured it at a considerable altitude in the Lemastota hills, into which it doubtless ascends from the Wellaway-Korale forests in the dry season. On the western side of the hill-zone Mr. Holdsworth has observed it in the Kandy district; but I have no evidence of its being found at a greater elevation than that.

This species is one of the earliest known Ceylon birds. Its gay plumage no doubt made it an object of attraction to the early travellers; and Forster described it in his 'Indische Zoologie' so far back as 1781, giving a plate of it done in the crude style of that period. He, however, does not make any mention of the discoverer of this interesting Ceylonese form, which leads to the inference that natives first made it known to Europeans in the island.

Habits.—This handsome bird is a denizen of forest and heavy jungle, and is of such a shy and retiring disposition that it is but little known to Europeans, even those who are stationed in the wilds of the interior.

The natives of the Western and Southern Provinces, a part of the island in which the population is chiefly located in the cultivated districts, are less acquainted with it than with most birds; but the inhabitants of the northern and eastern jungles, whose scanty villages are situated, for the most part, in the depths of those primæval wilds, recognize the *Mal-kændetta*, without hesitation, as a not uncommon bird. Layard, who considered its range to be limited to the mountain-zone, speaks of it as being eaten by the natives, and probably alludes to the Kandyans of the Dumbara district before it was denuded of forest, and when it contained this bird in much greater numbers than it does now. The natives of the "Friars-Hood" jungles, where it is commoner than in other parts of the island, call it "Warreliya," or "long tail."

The Malkoha is fond of tall or shady forest in which there is a considerable amount of undergrowth or small jungle, into which it often descends, after making a meal off the fruits of the lofty trees overhead. When flushed it invariably flies up into high branches and is difficult to come up with, as it quickly makes off, taking short flights from tree to tree. I have seen a flock of six or seven feeding among the topmost boughs of one tree, and noticed that they moved very quicky about among the leaves, sharply wrenching off the berries which they were seeking and devouring them whole. As a rule it is a silent bird, the only note with which I am acquainted being a rather low monosyllabical call like *kāā*, which it utters when flying about. Although I have occasionally found the remains of small insects in its stomach, it is almost exclusively a fruit-eating species, and its flesh is consequently by no means to be despised. It is tender and not unpleasantly flavoured; and Layard remarks, with justice, that the natives consider it a great delicacy. I have known an individual persistently return to a tree, on the berries of which it had been feeding, a few minutes after being shot at.

Nothing is known of the nidification of this species.

In the Plate accompanying this article, the figure in the background with the white eye represents a female shot in the Vanni.

Genus ZANCLOSTOMUS.

Bill more slender than and not so deep as in the last genus, not so inflated near the base; the gape more festooned. Nostrils ovoid, basal, and placed higher up than in *Phœnicophaës.* Eye surrounded by nude skin. Wings with the 4th and 5th quills subequal and longest. Tail, legs, and feet much as in the last. Shafts of the throat-feathers rigid.

ZANCLOSTOMUS VIRIDIROSTRIS.

(THE GREEN-BILLED MALKOHA.)

Zanclostomus viridirostris, Jerd. Cat. B. S. India, Madr. Journ. 1840, xi. p. 223, et Ill. Ind. Orn. i. pl. 3; Blyth, J. A. S. B. 1845, p. 200; id. Cat. B. Mus. A. S. B. p. 76. no. 375 (1849); Bonap. Consp. Gen. Av. p. 99 (1850); Kelaart, Prodromus, Cat. p. 129 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 453; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 690 (1856); Jerdon, B. of Ind. i. p. 346 (1862); Holdsworth, P. Z. S. 1872, p. 432; Legge, Ibis, 1874, p. 16, et 1875, p. 284; Hume, Str. Feath. 1876, p. 458; Fairbank, ibid. 1877, p. 397.

Phœnicophaus jerdoni, Blyth, J. A. S. B. 1842, p. 1095.

Rhopodytes viridirostris, Cab. et Heine, Mus. Hein. pt. iv. p. 63 (1862).

The Small Green-billed Malkoha, Jerdon, B. of India.

Kappra-popya, Hind.; *Wamana kaki*, lit. "Dwarf Crow," Telugu.

Mal-kœndetta, Sinhalese; also *Handi-koota* (*apud* Daniell); *Koosil*, Ceylon. Tamils (Layard).

Adult male and female. Length 15·0 to 15·75 inches; wing 5·1 to 5·4; tail 8·4 to 9·3; tarsus 1·3 to 1·35; outer anterior toe 0·9, its claw (straight) 0·3; bill to gape 1·2 to 1·4.

Iris deep brown; bill pale leaf-green; orbital skin in front of eye cobalt-blue, paling behind into pale bluish; legs and feet dusky green or greenish blue.

Above greenish grey, overcome with a strong green gloss from the hind neck down to the rump; lores, at the base of the bill, and round the orbital region shading into blackish; wings and tail deep metallic green, the tips of the quills dusky; terminal portion of tail-feathers white, deepest on the outer webs of all but the central pair, which are evenly tipped and with less white than the rest; throat blackish, with greyish or pale fulvous striæ, formed by the double tips of the feathers being of that colour, and exceeding the black shaft; on the chest the feathers gradually become fulvous-grey, and from that pure fulvous on the breast and abdomen; flanks, thighs, and under tail-coverts cinereous, the two latter washed with fulvous.

Some examples, probably immature birds, have the under surface paler than the above, and the upper surface less glossed with green; the striæ of the throat are less fulvous in some than in others.

The furcate formation of the throat-feathers is most singular, and was, it appears, first pointed out by Blyth, with his usual habit of minute and accurate observation.

Obs. On comparing Ceylonese with South-Indian examples, I find no appreciable difference; an individual from Madras measures as follows—wing 5·1 inches; tail 9·2; tarsus 1·35; bill to gape 1·23.

This species does not differ widely in plumage from the North-Indian *Z. tristis*, which has not got the under parts rufous, and has the throat whiter, with the nude skin round the eye crimson, instead of blue. The latter species, however, is much larger, the wing measuring 6¾ inches according to Jerdon, and it is consequently styled the "Large Green-billed Malkoha."

Distribution.—This Cuckoo is widely diffused throughout the low country of Ceylon, being most numerous

in the northern half and south-eastern division of the island, including, as regards the former, the Puttalam and Chilaw districts and the Seven Korales.

It does not, as far as I am aware, ascend into the hill-zone to any considerable altitude, although it is found in the hilly country at the base of the Hewa-Elliya ranges, at an elevation of about 1000 feet. In the above-mentioned low-country districts it is dispersed throughout the forests and low jungle, being everywhere to be found by those who know what sort of locality it frequents; in the south and west, however, it affects only those spots which are suitable to its habits. It is found in tangled thickets here and there throughout the Colombo district, and in the south-west corner of the island is more local still; for instance, it frequents the thorny tangled brake covering the peninsula on the east side of Galle harbour, and is scarcely to be found anywhere else in the neighbourhood. Mr. Holdsworth records it as abundant at Aripu; and further north, as well as in the island of Manaar, it is equally so. It is found in the Jaffna peninsula.

Elsewhere this Malkoha is found only in the south of India. In Ramisserum Island it is common, and likewise on the mainland of the peninsula. In the Palani hills Mr. Fairbank procured it at the eastern base. Jerdon says that it is found as far north as Cuttack, where it meets the larger species. "In the bare Carnatic and the Deccan," he writes, "it is chiefly to be met with in those districts where the land is much enclosed, as in part of the zillah at Coimbatore, where large tracts of country are enclosed by thick and, in many cases, lofty hedges of various species of *Euphorbia*. . . . . Throughout the west coast, where jungle and forests abound, it is much more common, especially in those parts where bamboos occur, and where numberless creepers entwine themselves and hang in luxuriant festoons from every tree."

Habits.—The Green-billed Malkoha frequents dense low jungle, the tangled edges of forest, scrub near the sea-coast or surrounding large woods, thickets, and so forth. It is not particularly shy, but does not care to subject itself to long observation, making off with a stealthy flight, and threading its way quickly through the most tangled underwood. I have often noticed it in pairs, but just as frequently flushed it singly, its mate being probably not far distant. In the Northern Province and the jungles to the south of Haputale, where it is abundant, it may frequently be seen flying across the roads. Its diet consists of various fruits and berries and also insects; in the stomach of one I found a large locust almost whole. In India it is said to be almost entirely insectivorous. Jerdon writes that it "diligently searches the leaves for various species of *Mantis*, Grasshopper, and Locust, whose green colours and odd forms, though assimilating so strongly to the plants on which they rest, are but of little avail against its keen and searching eye." In his 'Birds of India,' he remarks that he never found it feeding on fruit; in Ceylon it is the exception to find that it has partaken of any thing else. It is difficult to flush a second time; for when thoroughly alarmed it skulks in the thickest underwood it can find, or escapes, by the use of its legs, among the branches forming its retreat. Its note is a low crake, sounding like *krāā*, generally uttered after it has been flushed; but it is usually of a silent habit.

Nidification.—We are indebted to Miss Cockburn for the only information yet to hand of this bird's nesting. She obtained one nest in March on the Nilghiris. It was large, and consisted of sticks, put together much in the style of a Crow-Pheasant's nest. It contained two white eggs.

Genus CENTROPUS.

Bill very strong, high at base, well curved throughout. Nostrils lateral, and protected by a membrane. Wings rounded, the 6th quill the longest. Tail long, wide, considerably graduated. Tarsi stout and shielded with broad transverse scales, longer than the anterior toe with its claw. Toes stoutly scaled; hind claw very long and straight. Feathers of the head, neck, and throat spinous.

CENTROPUS RUFIPENNIS.

(THE COMMON COUCAL.)

Centropus rufipennis, Illiger, Abhandl. Akad. Wiss. Berl. (1812) p. 224; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 681 (1856); Jerdon, B. of Ind. i. p. 348 (1862); Holdsworth, P. Z. S. 1872, p. 433; Jerdon, Ibis, 1872, p. 15; Hume, Nests and Eggs (Rough Draft), p. 142 (1873); Legge, Ibis, 1874, p. 16; Morgan, Ibis, 1875, p. 315.

Centropus philippensis, Sykes, P. Z. S. 1832, p. 98; Blyth, J. A. S. B. 1842, p. 1099; id. Ann. & Mag. Nat. Hist. 1847, p. 385; id. Cat. B. Mus. A. S. B. p. 78 (1849); Kelaart, Prodromus, Cat. p. 128 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 450.

Centropus castanopterus, Steph. Gen. Zool. xiv. i. p. 215 (1826).

Centropus pyrrhopterus, Jerdon, Cat. B. S. Ind., Madr. Journ. 1840, xi. p. 224.

Centrococcyx rufipennis, Ball, Str. Feath. 1874, p. 394; Fairbank, Str. Feath. 1877, p. 397.

The Philippine Ground-Cuckoo, Kelaart; *The* "*Crow-Pheasant*," Europeans in India and Ceylon, also "*Jungle-Crow*," in Ceylon; "*Lark-heeled Cuckoo*," Jerdon's Catalogue.

Mahoka, Hind.; *Kuka*, Beng.; *Marmowa*, at Monghyr; *Jemudu-kaki*, lit. "Euphorbia Hedge-Crow," Tel.; *Kalli-kaka*, lit. "Hedge-Crow," Tam. (Jerdon).

Ætti-kukkula, Sinhalese; *Chembigum*, Ceylonese Tamils.

Adult male and female. Length 17·5 to 18·5 inches; wing 7·3 to 8·1; tail 9·5 to 10·0; tarsus 1·9 to 2·0; outer anterior toe (with claw) 1·75 to 1·9; hind toe 0·6, its claw 0·8 to 0·83; bill to gape 1·65 to 1·85.

Females appear to average larger than males.

Iris vermilion; eyelid blackish leaden; bill black; legs and feet black.

Entire plumage, with the exception of the scapulars and wing-coverts (which are glossy cinnamon-rufous) black, dull on the crown and throat, and with the hind neck and its sides, as well as the chest and upper breast, illumined with steel-blue edgings, blending into a greenish hue at the centres of the feathers; these hues are brightest on the hind neck; back, rump, and flanks moderately glossed with greenish; tail-feathers glossed with green, mostly on the four lateral feathers; forehead and chin brownish, gradually darkening into the hue of the crown and throat respectively; tips of the quills smoky brown; scapulars somewhat darker rufous than the wings; under wing-coverts shaded with blackish.

The gloss on the tail-feathers varies in individuals; in some the central pair have scarcely any, the ground-colour partaking slightly, if examined carefully, of a ruddy-brown hue.

Young. The yearling bird has the head and nape marked with rufous striæ; hind neck barred with fulvous; scapulars and wings crossed with rather broad bars of blackish; tail barred with spear-shaped bands of dusky whitish; throat-feathers centered and barred with fulvous; breast and thighs the same.

The above description of the young is from an Indian individual; I have not had the opportunity of examining Ceylonese examples in the immature stage, but they have been described to me as similar to the one here noticed.

Layard procured an albino of this Cuckoo at Pt. Pedro, in which "the black and purple portions were changed to a dirty creamy white, the dark red portions to a light brown."

Obs. Ceylonese *C. rufipennis* differs from the Indian bird of this species in its paler forehead and throat, these parts, as a rule, being in the latter concolorous with the adjacent dark plumage. I say, as a rule, because I find that, as in Ceylon, so in India, examples vary *inter se* in this respect; an example from Kamptee and another from the North-west Province are so close to the insular bird that the latter cannot well be discriminated as a separate race. Mr. Swinhoe, when at Galle, shot a pair of Coucals, which he considered ('Ibis,' 1873, p. 230) distinct from the true *C. rufipennis*, on account of their smaller size and larger bills (the size of bill is not given), as well as their broader tail-feathers barred obscurely across. The wings measured 7¼ inches, which corresponds with those of Indian specimens; the tails evidently point to the individuals being immature.

An example in the British Museum from Kamptee measures 7·3 inches in the wing, and four measured and recorded by Mr. Ball are as follows:—Sex?, Gangpur, 7·7; ♂, Rajmehal hills, 7·2; ♂, Satpuras, 7·8; ♂ juv., Calcutta, 7·55. These would compare very well with five Ceylonese examples taken at random from a series. The tails of the first three here enumerated measure 10·8, 10·5, 10·5 inches respectively; this is longer than they ever attain to in the insular bird, and I have observed the same inferiority in this respect when comparing my specimens with those in the national collection.

The larger species (*C. eurycercus*) from Borneo, Labuan, Sumatra, Java, as well as from Tenasserim, Burmah, Nepal, Sindh, Sikkim, and other parts of India (if the continental species be the same), differs from *C. rufipennis* in having the back coloured red like the wings, which are a paler rufous than in the latter species; likewise in the blue-glossed tail and the much more metallic blue lustre of the hind neck, and finally in the darker under wing-coverts: it is, in all its races, a larger bird than *C. rufipennis*. A Labuan specimen measures 8·8, a Sumatran 8·7, and a Bornean 8·6 inches in the wing; the Sindh and Sikkim birds vary from 9·0 to 9·5 according to Mr. Hume, and some I have measured from other localities 7·9 to 8·3.

Distribution.—The "Jungle-Crow," or "Crow-Pheasant" as it is popularly called, is found throughout all the low country, including the island of Manaar and the Jaffna peninsula, in which latter districts, as well as in most of the north of the island, it is extremely abundant. It ascends the hills, ranging up to 3000 feet throughout the year in some districts, and reaching the altitude of the Nuwara-Elliya plateau in the cool dry season. In June I have met with it in Upper Hewahette, and in January I have heard it behind Hakgala mountain and in the railway gorge.

It is very abundant in the south-west and west of the island, and is tolerably numerous in the Eastern Province and along the north-east coast. At Trincomalie it frequented the native gardens in the heart of the Bazaar. In forest-districts it is local, being chiefly found where the jungle has been cut down and low scrub grown up. It is common in Dumbara, and particularly about Kandy, Paradeniya, and generally along the banks of the Mahawelliganga. On the Uva patnas it is not uncommon; and in Haputale Mr. Bligh has seen it above 4500 feet.

On the continent the Common Coucal inhabits chiefly the southern and central portions of India. It is common in Ramisserum Island and on the adjacent coast, and Mr. Fairbank observed it up to 3500 feet in the Palani hills; it likewise inhabits and breeds in the Nilghiris. It is common in the Deccan and in the Khandala district especially. Mr. Ball writes, "The Crow-Pheasant is tolerably common throughout the Chota-Nagpur division," but "circumstances, which it is not easy to detect, seem to influence the distribution of this bird. In some portions of the district I have been for weeks without seeing a single specimen, suddenly then I come upon a tract in which I do not fail to hear or see several every day."

In the North-west Provinces it is also found, as well as in the plains of Upper India. Mr. Hume remarks that it is abundant along the banks of the larger rivers in Sindh, but that in lower Sindh it is less common than in upper. In the Sambhur-Lake district it is "very rare" (*Adam*).

Habits.—The Common Coucal inhabits almost every variety of situation except gloomy forest, the interior of which it shuns. In the south and west of the island it is found in low woods, cultivated lands, the outskirts of heavy jungle, compounds, native gardens, and the borders of paddy-fields, and is usually a shy bird, betaking itself, when flushed in the open, to the cover of the adjacent wood, and quickly climbing and making its way through the branches out of sight. In the north, particularly in the Jaffna peninsula, it is the very reverse of

shy, walking about the native compounds sometimes close to houses, and exhibiting no concern with regard to the inmates. It may be that it finds its food scarcer here in the dry season than in the less parched-up districts in the south. It walks with an even and stately gait, or proceeds with long hops, and, when winged and pursued, runs with great speed through the jungle, and is exceedingly difficult to capture unless stopped with a second shot. Some of its habits are very curious; and Layard remarks with truth, "On being alarmed it scrambles rapidly to the summit of the tree in perfect silence, and glides away in a contrary direction to that whence the cause of its terror sprung." It resorts often to a favourite tree to roost, probably a shady "Jack," or, better still, an Areca-palm, of which it is very fond, and which generally stand in the vicinity of native houses. Into these it flies late in the evening, when it can take refuge in them unobserved, and then hides itself in the thickest part of the foliage. At daybreak the following morning its deep notes are heard issuing from the thick foliage and answered by the bird's mate, who is in another tree close at hand; but there is not a sign of either to be seen: this conversation goes on at intervals, and I have known it sometimes to last for twenty minutes before either of the Coucals stirs from the spot in which it has passed the night: when the time has come for a move, they hop out from their night's quarters, and fly away sometimes in opposite directions, and are seldom seen in close company during the day.

There is perhaps no bird-note in Ceylon so well known, nor one which strikes the new arrival from Europe with such astonishment, as the wonderful sound which this Cuckoo issues from its capacious throat. It is heard far and wide for miles on a still evening, and is so deep and weird-like that it is difficult to imagine it is produced by a bird, still less by so small a one as this. It consists of a single call quickly repeated, which may be syllabized as *hōōop, hōōop, hōōop*; and this is uttered with the mouth wide open and the bird's head thrust down sideways at each note, an exertion which appears necessary to bring out such a voluminous sound. The most lengthy description on paper would fail to give any idea of the nature of the voice of this and, still more, of the next species; but I am perhaps not wrong in maintaining that the luxuriant woods, the sequestered vales waving with verdant fields of rice, the forest-clad hills and shady palm-groves, all of which go to form the smiling face of nature in Lanka's isle, would lose no little of their charm for the ornithologist were they devoid of the Crow-Pheasant's resounding call.

It feeds on a great variety of insects and even reptiles, consuming beetles, slugs, scorpions, centipedes, lizards, and, I believe, small snakes sometimes. It pilfers birds' nests, and eats either eggs or very young birds. Mr. Parker informs me that he has seen one trying to get up the tube of a Weaver-bird's nest to attack the young in it, but in this it failed. Jerdon records the fact of a gentleman in the Indian Custom's department having seen one of these birds dragging along a young hedgehog by the ear, a task which it could not well have undertaken had it not contemplated making a meal off the unfortunate animal.

Nidification.—The species breeds from May until September. Its nest, which is not often discovered, is built in a low tree, generally in the midst of thick woods, and is a large globular structure, composed of twigs and small sticks, with an opening in the side near the top, and is fixed in a fork of a branch or among a mass of small thick boughs. One which I found close to the bungalow on the Gangaroowa estate was placed in a *Lantana*-thicket; it was near the top of a tangled mass of the branches of this well-known pest (*Lantana mixta*); the body of the structure rested in a large saucer-like foundation constructed by the bird of the branches of the *Lantana*, mixed with others brought to the spot; it was about a foot in external diameter, and the exterior was lind with roots. The eggs were two in number, stumpy ovals in shape, and of a chalky texture, although the surface was smooth; the colour was pure white in one and buff in the other, and they measured 1·54 by 1·14 inch and 1·45 by 1·16 inch.

In India it has been observed by Mr. Blewitt that the nests are not always domed, some that he has found being simply structures about the size of a large round plate, with a depression in the centre for the eggs; in some instances the nests are placed high up in large trees and in an exposed situation. Three appears to be the normal number of the eggs, although four or five are sometimes met with.

CENTROPUS CHLORORHYNCHUS

CENTROPUS CHLORORHYNCHUS.

(THE CEYLONESE COUCAL.)

(Peculiar to Ceylon.)

Centropus chlororhynchus, Blyth, J. A. S. B. 1849, xviii. p. 805; Gray, Gen. Birds, iii. App. p. 22 (1845); Blyth, Cat. Birds A. S. B. p. 78 (1849); Kelaart, Prodromus, Cat. p. 128 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 450; Cab. et Heine, Mus. Hein. iv. p. 116 (1862); Blyth, Ibis, 1867, p. 298; Holdsworth, P. Z. S. 1872, p. 433; Legge, Ibis, 1874, p. 16.

Green-billed Jungle-Crow, Europeans in Ceylon.

Ætti-kukkula, Sinhalese, Western Province.

Similis *C. rufipenni*, sed rostro viridi et magis curvato: pileo et collo postico amethystino-purpureo nitentibus: interscapulii plumarum apicibus scapularibusque concoloribus: remigibus terminaliter magis quam in *C. rufipenni* infuscatis.

Adult male and female. Length 16·2 to 17·75 inches; wing 6·3 to 6·5; tail 9·0 to 9·5; tarsus 1·7 to 1·8; outer anterior toe 1·35 to 1·5, its claw (straight) 0·5; outer posterior toe and claw 1·4, long posterior claw 0·7; bill to gape 1·6 to 1·75.

Iris deep red or dull crimson; bill pale apple-green, slightly pale along the margins; inside of mouth, except towards the tips, orbital skin, and nostril-membrane black; legs and feet black; claws dusky, greenish at the base.

Entire plumage, except the wings, scapulars, and tips of interscapular feathers, black, glossed on the back of the head, hind neck, upper part of interscapulary region, and the throat with purple, changing towards the tips of the feathers into beautiful amethystine; the lower parts and upper surface of tail with blue, and the back with obscure metallic green; the quills are dark chestnut, much more infuscated at the tips than the last species; the wing-coverts and scapulars are darker still, or of a dull maroon, with the bases of the feathers blackish; under wing-coverts blackish.

Young. The fledged nestling has the iris slate-grey; bill dusky at base and along the culmen, with the apical portion greenish; legs and feet dusky flesh-colour.

Wings and scapulars red as in adult, black plumage the same; but the feathers of the head are encased in soft sheaths or "pens," each of which terminates in a long white hair-like process, which in time drops off, the feather emerging from the tip.

The *yearling* bird has the bill as in the adult, but with the tip of the lower mandible dusky. The upper plumage is not so highly bronzed as in the old bird; wing-coverts obscurely barred with blackish, tips of quills more infuscated; inner webs of tertials concolorous with the tips.

Obs. This species is closely allied to the preceding, its most conspicuous distinguishing characteristic being its green bill, which is also more curved than that of *C. rufipennis*; but the richer metallic hues and dark-tipped wings would well suffice to separate it even were the bill of the same colour.

Distribution.—This handsome species was discovered by Layard in 1848 on the Avisawella road; but one specimen was then procured by him, which was forwarded to Blyth and described by this naturalist under its present title. In 1852 Layard again met with it, securing another example at Hanwella and three more "in the dense jungle near Pallabaddoola, at the foot of the Peak." These researches, therefore, gave but a very small range, the extreme limits falling within forty miles. Mr. Holdsworth records the fact of seeing an individual of the species once, but did not procure it. Mr. Neville, I understand, obtained several specimens in the Western Province, probably between Ratnapura and Colombo, and was, prior to the date of my acquaintance with it, the only collector who, besides Layard, as far as I am aware, ever procured it.

Instead of being so rare as was hitherto supposed, this "Jungle-Crow" exists in considerable numbers throughout the tract of country which it inhabits. This consists of the south-west hill-region, ranging from

the many jungles near Galle up to the altitude of the coffee-districts of the Morowak Korale, the whole of the Western Province, and the strip of country lying between Kurunegala and Dambulla. In this latter region I do not think it extends into the Seven Korales beyond the influence of the hill rains. It is not uncommon on the Deduru-oya and in the jungles between the Ambokka range and the outlying rocky hills, of which the Dolookanda forms the most conspicuous point; and I have met with it as far north as the Kimbulana-oya, where it is crossed by the direct road from Kurunegala to Anaradjapura *viâ* Rambawe.

This portion of the Seven Korales is very dry, and this bird only inhabits there the heavy jungle on the borders of the seasonal rivers and streams. Whether it extends out to the north-west beyond the locality indicated I am unable to say; but near the hills I have traced it from Kurunegala up to the vicinity of Dambulla. To return to the Western Province, which is its head-quarters, this bird is there common in all the heavy forest and jungle, as well as in bamboo-cheena from Ambepussa to Ratnapura, inhabiting all outlying dense woods between this line and Colombo. About Hanwella, in the Ikkade-Barawe forest, in the jungles near Poré, and thence south to Horenne, its deep booming note may always be recognized by those who know it, and in the forest named it is abundant. I found it numerous in the Ratnapura district, and traced it up to Pallabaddoola, which is high up (2500 feet) in the Peak forest. To this elevation, and perhaps somewhat higher, it doubtless ascends all along the western slopes of the Kandyan hills and round through the Peak jungles for some distance east of Ratnapura. Westward of this place I met with it through the Pasdun Korale to Agalewatta; and southward of this it will be found to occur sparingly in the jungles on either side of the Bentota river, and other heavily timbered localities between there and the Hinedun-Pattu hills. I have heard it near Denniya and in the Singha-Rajah forest. Near Galle it is met with in the Kottowe jungles. I have thus far taken pains to trace out the distribution of this little-known bird perhaps more minutely than may at first sight be thought necessary; but it seems expedient so to do, as it is so seldom seen that many who are not acquainted with its note would pass it over entirely did they not know in what districts to look for it. I cannot say how far eastward of Ratnapura it extends, nor whether it occurs on the eastern slopes of the Kolonna Korale; but in all probability future research will much extend its limits both in the south and probably also round the northern base of the Kandyan hills.

Habits.—Of all our forest birds perhaps the present species is the most wary and seldom seen, scarcely ever emerging from the almost impenetrable fastnesses in which it lives. The Ceylon Coucal almost defies all discovery except by those who have made themselves acquainted with its note and care to follow it into its retreat. It is a denizen of tangled thickets, underwood in forests and on the banks of rivers, dense bamboo-jungle (to which it is especially partial), ratan-cane brakes, and such like, and rarely shows itself in the open except by the side of a road passing through forest, to which it will drop for an instant from an adjoining tree on espying a grasshopper or other insect, quickly retreating again under cover before any but the quickest shot can secure it. In the early morning, when the bamboo-cheenas in the wild parts of the Western Province are resounding with its deep far-reaching call, it mounts up from the underwood into some creeper-covered tree, which is a favourite situation with it, and gives forth its sonorous, long-drawn *hōō—whōōp, whōōōp*, which can be heard with distinctness for many miles round, echoing far over the luxuriant glades and waving rice-fields into the distant beetling wooded crags, from which it is answered back by more than one of its lurking fellow mates; for, as is the case with its congener, one note thus given out is the signal for many more, called forth from all sides, until there is a sudden cessation, as if by common consent. As will be gathered from my remarks on its habits, it is an exceedingly difficult bird to procure; for years I had been seeking it in the jungles of Ceylon, knowing well that the loud peculiar Coucal-notes which I often heard in the damp forests of the west could not be those of any other bird, but was never able to procure a specimen, until one morning, in the Hewagam Korale, I penetrated into a dense bamboo-thicket towards a huge overgrown tree, in which one of these birds was sending forth an unusual number of its sepulchral calls, and succeeded in bagging it, thus identifying the species with its note and enabling me, by adopting this device, to procure many specimens, and to jot down in my notebook, on auricular testimony, its distribution wherever I went. Its habit is to call for several hours in the morning and evening, or after a shower of rain, when it mounts up into a tree to escape the dripping underwood and dry its plumage. When disturbed, or after re-alighting on being flushed, it has a very singular monosyllabic note, somewhat resembling the dropping of a

stone into deep water, and which may be likened to the syllable *dhjōonk*; this is uttered by both sexes; but whenever I procured a specimen uttering the loud call in question it proved to be a male. Its diet consists of Coleoptera, spiders, snails, and grasshoppers, and in the stomach of one example I found a number of minute Ammonites. When winged it runs, like the preceding, very rapidly through the dense jungle and quickly escapes pursuit.

Nidification.—The breeding-season probably begins in April or May and lasts until July. In August I procured the nestling which forms the subject of the accompanying Plate, and which had not long left the nest. It was seated on a low branch in some dense underwood and uttered a sound resembling the note of the adult, but not so deep. On the first occasion that I heard it I was unable to find the bird, supposing it to be an old one which had flown away on my approaching it; but on passing the exact spot the following day I again heard the note, and succeeded in finding its author, which must have remained in precisely the same position during the 24 hours that had intervened. The nest and eggs are, in all probability, almost identical with those of the Common Coucal, the latter being perhaps somewhat smaller.

The figure in the Plate represents an adult bird, shot in the Seven Korales, feeding the nestling alluded to, which was procured in Mr. Chas. de Zoysa's fine forest at Kuruwite, where the species is abundant.

Genus TACCOCUA.

Bill higher than wide at the nostrils, the culmen much curved and hooked at the tip, the margin boldly lobed at the base. Nostrils exposed, basal, almost linear and pierced in a depression near the margin. Wings short and rounded, the 4th quill the longest. Tarsus as long as the inner anterior and outer posterior toes without their claws, covered with very broad scales.

Feathers of the fore neck and chest with very stiff shafts. Eyelid furnished with stout eyelashes.

TACCOCUA LESCHENAULTI.

(THE DARK-BACKED SIRKEER.)

Taccocua leschenaulti, Lesson, Traité d'Orn. p. 144 (1831); Blyth, J. A. S. B. 1845, xiv. p. 201; id. Cat. B. Mus. A. S. B. p. 77 (1849); Jerdon, B. of Ind. i. p. 352 (1862); Holdsworth, P. Z. S. 1872, p. 433 (first record from Ceylon); Hume, Nests and Eggs (Rough Draft), p. 145 (1873); Legge, Ibis, 1875, p. 285; Hume, Str. Feath. 1877, p. 219.

Zanclostomus sirkee, Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. p. 223; Blyth, J. A. S. B. 1842, xi. p. 98.

The Southern Sirkeer, Jerdon.

Jungli totah, Hind.; *Adavi chilluka* and *Potu chilluka*, lit. "Jungle-Parrot" and "Ant-hill Parrakeet," Telugu (*apud* Jerdon).

Adult male and female. Length 15·5 to 16·0 inches; wing 5·9 to 6·25; tail 8·2 to 9·0; tarsus 1·6 to 1·7; outer anterior toe 1·0, its claw (straight) 0·35; bill to gape 1·4 to 1·55. Weight $5\frac{1}{4}$ oz. Longest upper tail-covert feather 4·5 (about). The bill is very variable in size.

Iris reddish, with a brown inner circle and sometimes a yellowish exterior edge; bill cherry-red, with the tips yellowish and an angular black marginal patch continued along the edge to the gape; legs and feet bluish plumbeous or plumbeous, claws blackish; orbital skin blackish (?).

Above olivaceous brown, with a strong greyish-green lustre on the back, scapulars, and wings; the shafts of the head, neck, interscapular region, as well as the throat bristly and blackish in colour: tail metallic brownish green, becoming much darker towards the sides, the two outer pairs of feathers being deep brown above; all but the centre pair deeply tipped white, increasing towards the outer feathers.

Orbital bristles or eyelash black, with white bases; feathers of the lores and round the orbital skin whitish; chin and upper part of throat whitish, passing into pale brownish on the fore neck and chest; beneath this the under surface is rufous, deepest on the lower parts and tinged with yellowish on the breast; vent and under tail-coverts grey-brown, the feathers of the latter tinged with rufous at their extremities: rectrices dark brown beneath.

Examples vary in the depth of the rufous of the under surface, and in those which have it deep the throat is pervaded with a fulvous hue.

Young. Birds of the year have the wing-coverts, tertials, and scapulars tipped strongly with fulvous.

Obs. Ceylonese examples all belong to the dark-backed race, considered to be the typical *leschenaulti*. Four species have been recognized of this genus, two of which were separated by Mr. Bligh from Lesson's and Gray's types (*T. leschenaulti* and *T. sirkee*) and styled by him *T. infuscata* and *T. affinis*. All four are very closely allied; and

Mr. Hume, who appears to have now a larger series than has ever been before got together, writes that he can only satisfy himself of the existence of two forms—the present, with the dark olive-brown back, and *T. sirkee* with the pale sandy or satiny-brown upper surface. From an examination of a small series in the British Museum from different localities, I think that his conclusions are likely to prove correct. Three examples from Capt. Pinwill's collection, now in the British Museum, measure in the wing 6·4, 5·9, 6·3 inches, two exceeding my maximum dimension; these are the dark-backed race; but they differ slightly from the Ceylonese bird in the forehead being somewhat rufous and in the rufescent hue of the breast ascending up the throat: the island race is characterized, on the contrary, by its darker or grey fore neck and whitish chin, and the forehead is concolorous with the crown. Typical specimens of *T. sirkee*, the Bengal species, have the back, scapulars, and wing-coverts very pale sandy yellowish above, and the throat and fore neck very pale rufous.

Distribution.—The first specimen of this curious Cuckoo procured in the island was killed by Mr. Forbes Laurie in Dumbara, whither the species ascends from the low country at Bintenne. It is not a rare bird, but, being very shy and inhabiting the densest thickets, appears to have escaped the researches of ornithologists previously working in Ceylon. Its head-quarters, I consider, are the hot jungle-clad districts lying to the south of Haputale and stretching thence from the eastern slopes of the southern ranges through the Bootala and Maha Vedda Ratas to the country lying between Bintenne and the east coast. Thence it ascends the mountain-slopes—on the south, those of the Badulla and Haputale ranges; on the east, those extending from Hewa Elliya past Maturata to Medamahanuwara. Although I have not met with it north of the latter region, it is most probable that it inhabits the whole of the Vedda country round the "Gunner's Coin" mountain almost to the Virgel river, for this is precisely similar in character to that about Kattregama, where I first saw it and where it is common. I have procured it in the Wellaway Korale, and Mr. Bligh has killed several specimens above Lemastota at about 2500 feet elevation. It is pretty common near Nilgalla, inhabiting the open jungle on the elevated cheenas between Kaloday and Bibile. Here I saw three or four specimens in a single day. The most elevated region in which it has as yet been observed is the Uva patna-district, in which I have met with it near Wellemade on a hill about 3500 feet in altitude. This portion of the Central Province, consisting of steep patnas and deep wooded ravines, is little known to naturalists, or, in fact, to any but occasional sportsmen, who descend to it from the neighbouring coffee-estates either for Snipe- or Partridge-shooting. It attains an altitude near Banderawella of about 4000 feet, and on the north-east slopes away to Badulla, and thence into the low country at Teldeniya, where the Sirkeer is found, and whence it ascends into the patnas, very probably inhabiting the whole region. On the mainland this species is found in Southern India. Jerdon writes that he procured it on the Eastern Ghâts, in the Deccan, and on the Nilghiris, finding it in grassy slopes from 5000 to 6000 feet elevation. Its range, however, would appear to extend to the north of India. I have seen specimens from the N.W. Provinces; and Mr. Hume has it from Dehra Doon and Kumaon Bhabur (still further north), as also from Sumbhulpoor, Raipoor, Khandala, and other places in Central India. The Bengal species is found in the Sambhur, Guzerat, Kutch, and other western districts, as well as in other parts of the Presidency.

Habits.—The Sirkeer is a shy bird, frequenting dry jungle in open grassy country, low scrub, tangled thickets, and bushy patna-tracts in the Central Province. It feeds almost entirely on the ground in long grass, never straying far from its native fastnesses, and, as far as I have been able to observe, only issuing from them in the morning and evening, at which times it principally feeds. It is found by the sides of jungle-roads and on patches of ground under native cultivation which are surrounded by dense scrub. I have, following the winding native track, more than once entered these enclosures, generally from 5 to 10 acres in extent, and immediately on my emerging from the wood into the open have espied one of these birds at the far end making off instantly for the cover; on alighting at the edge of the jungle they quickly thread their way, like a *Centropus* ("Jungle-Crow"), from branch to branch, and are not many seconds before they disappear into the impenetrable thicket around them.

Its diet principally consists of grasshoppers, Mantidæ, and other insects, which it captures in long grass and with which it crams itself to excess. Mr. Bligh writes me that since I left the island he shot one near Lemastota with a freshly killed brown lizard in its stomach; it was very thick and about 8 inches long, and

was coiled away neatly, even to the tip of its tail; it had one deep cut across the brain-region nearly severing its head in two.

Jerdon writes that in India it is seen much about white ants' nests, whence its Telugu name, "the appellation of Parrot being given to it from its red bill."

I know nothing of its nesting; but Mr. Bligh writes me that a female killed during the S.W. monsoon showed signs in its breast-plumage of having lately incubated, which points to the breeding-season being in June and July.

Fam. TROGONIDÆ.

Bill short, stout, very wide at the gape, and consequently somewhat triangular; culmen curved. Nostrils concealed by bristles. Tail of twelve feathers, long and broad, sometimes surmounted by a long caudal train. Tarsus very short; feet small and zygodactyle.

PICARIÆ.

TROGONIDÆ.

Genus HARPACTES.

Bill very short and broad; upper mandible deep; culmen much curved, the tip with a small notch; gonys short, deep, and much ascending. Nostrils basal, narrow, situated in a membrane, which is protected by bristles. Chin furnished with weak bristles. Wings short, the primaries much decurved; the 4th and 5th quills the longest, the 1st rather short. Tail broad, much graduated, even at the tip. Tarsus half-feathered; inner anterior toe slightly longer than the outer; inner posterior toe much longer than the outer one.

Eye surrounded by a naked skin.

HARPACTES FASCIATUS.

(THE CEYLONESE TROGON.)

Trogon fasciatus, Forster, Ind. Zool. p. 34, pl. 5 (1781); Gm. ed. Linn. Syst. Nat. i. pt. 1, p. 405 (1788).

Trogon ceylonensis, Briss. Orn. vol. ii. p. 19 (1763).

Trogon malabaricus, Gould, Mon. Trogonidæ, 1st ed. pl. 31 (1838).

Harpactes malabaricus, Sw. Classif. Birds, vol. ii. p. 337 (1839); Jerd. Cat. B. S. India, Madr. Journ. 1840, xi. p. 232.

Harpactes fasciatus, Blyth, Cat. B. Mus. A. S. B. p. 80 (1849); Kelaart, Prodromus, Cat. p. 118 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 171; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 714 (1856); Legge, J. A. S. (Ceylon Br.), 1870–71, p. 35; Holdsworth, P. Z. S. 1872, p. 422; Hume, Str. Feath. 1873, p. 432, et 1876, p. 498; Ball, ibid. 1874, p. 385, et 1876, p. 231; Legge, Ibis, 1874, p. 13, et 1875, p. 281; Bourdillon, Str. Feath. 1876, p. 382; Fairbank, ibid. 1877, p. 393.

Pyrotrogon fasciatus, Cab. et Heine, Mus. Hein. iv. p. 156 (1862).

Der Band-Kuruku, Forster; *The Fasciated Curucui*, Gmelin; *The Fasciated Trogon*, Kelaart; *Red Flycatcher*, Europeans in Ceylon.

Kufni churi, Hind.; *Karra*, Mahrattas; *Kakarne hakki*, Canarese.

Nawa nila kurulla, Ranwan kondea, Ginni kurulla, Sinhalese.

Adult male and female. Length 10·5 to 11·2 inches; wing 4·4 to 5·0 (average about 4·7); tail 5·4 to 6·0, outermost feather 3·0 shorter; tarsus 0·55 to 0·7; inner anterior toe 0·6, its claw (straight) 0·3; inner posterior toe 0·4; bill to gape 0·9 to 1·05.

Females slightly the smaller of the sexes.

Iris hazel-brown or reddish brown, in some with a pale outer circle; bill, orbital skin, eyelid, and gape French blue, the orbital skin being the palest; culmen and tips of mandibles black; legs and feet delicate greyish blue, claws bluish horn.

Male. Head, nape, face, and chin dull black, paling gradually to dark slate on the fore neck and upper part of the chest; hind neck partially denuded of feathers; back and scapulars yellowish olive-brown, paling into rufescent

fulvous on the rump and upper tail-coverts; least wing-coverts concolorous with the back, the remainder of the wing black, crossed with narrow bars of white on the wing-coverts, tertials, outer webs and tips of secondaries; all but the first primary with a clearly-defined white outer edge; the three centre pairs of tail-feathers cinnamon-rufous, the central pair almost entirely so, with a fine black tip; the next two black at the tip and on the terminal portion of the inner web; the next two with almost all the inner webs black; the three outer pure white on the terminal half, black on the basal, and with a rufous edge except on the outermost.

Female. Has the back and rump as in the male; but the head and hind neck are brown, darker than the back; the throat and fore neck light olive-brown and the chin blackish; the wing-coverts, outer webs of secondaries, and the tertials are barred with bands of fulvescent-rufous, broader than the white bars of the male; breast and under surface fulvous, the white pectoral band wanting.

Young male. Bill and orbital skin duller than in the adult. In nest-plumage the male has the head and face slaty black, back and tail as in the adult; the median wing-coverts barred with narrow bars of fulvous, and the outer webs of the secondaries with broader bars of the same, slightly paler than these markings in the female; the chin is black and the fore neck slate-colour; the under surface is paler fulvous than the adult female, and the white pectoral band is present. An individual shot in January, in the Northern Province, has the wing-coverts with white-and-rufous barred feathers, and the under surface with fulvous and scarlet ones.

Obs. Mr. Hume has called attention (*loc. cit.*) to the fact that Ceylonese examples are smaller than Indian; and he points out the following difference in the tail of the island race:—"Instead of the central tail-feathers being entirely chestnut with moderately black tips, and the next pair entirely black, they have all the four central tail-feathers black on the inner webs and on the outer webs for about one inch, the rest of the outer webs being chestnut." As a matter of fact the pair adjacent to the central one have the black only on the inner web, at least in a good series I have obtained, so that these feathers may be said to be almost entirely rufous, which is a great dissimilarity to the same in the Indian bird. I have not been able to examine any South-Indian specimens, and cannot express an opinion as to whether it is the rule to find them with such black tails. If the Indian species is to be separated, it must bear another name, as it is the Ceylonese bird which is *fasciatus*, it having been described by Forster, in his 'Indische Zoologie,' from Ceylon.

Mr. Fairbank gives the following measurements of specimens killed in the Palanis:—♂, length 12·5 inches, wing 5·0, expanse 16·0, tail 7·0, bill from gape 1·1; ♀, length 12·0, wing 5·0, expanse 15·75, tail 7·0, bill from gape 1·0. An individual shot in Sambalpur by Mr. Ball measures—length 11·5, wing 5·0, tail 7·0. From these dimensions it would appear that Indian examples differ chiefly in the length of the tail, but do not much exceed Ceylonese ones in the wing.

Forster's plate of this species is a good representation of it; the figure is that of a male bird lying on the stump of a tree.

Distribution.—This very handsome bird is widely diffused throughout Ceylon, and is by no means uncommon, although, being entirely a denizen of the forest, it is not much known among Europeans. In all parts of the island it is found wherever there is lofty jungle, which it frequents by choice. It is met with near Colombo, at Atturugeria and Ikkade Barawe, and inhabits the forests in the interior of the Western Province. In the south it is found in the timber-jungles near the Gindurah, those throughout the Hinedun Pattu, and in the Kukkul and Morowak Korales. The Singha-Rajah forest is a great stronghold of this species; its gloomy ravines clothed with fine timber-jungle, entwined in many places with enormous ratan-canes, which flourish on the incessant rains of that region, afford it a paradise. In the Eastern Province I found it common in the Friars-Hood hills, in the Nilgalla district, and other localities clothed with heavy jungle. In the north it is locally distributed, being confined to heavy forest, in which I have procured it about 15 miles from Trincomalie. At the northern base of the Matale ranges it is common, and is diffused throughout all the coffee-districts, ascending to the upper ranges in the dry season. Mr. Holdsworth met with it at Nuwara Elliya in February, and I have seen it at Kandapolla in January.

In India Jerdon found it in the forests of Malabar, from the extreme south up to about north latitude 17°, reaching up the Ghâts and hill-ranges to at least 3000 feet. Referring to 'Stray Feathers,' we find Mr. Fairbank procuring it first on the Palani hills at an elevation of 3500 feet, and finding it up to 5000 feet elevation. Mr. Bourdillon records it as a common bird in heavy jungle on the Travancore hills above 1000 feet; north of this region the former gentleman notices it as found in the woods of Sawant Wade, in the Khandala district. In the Central Provinces Mr. Thompson has procured it in the Ahiri forests, in lat. 19° 30′; Mr. Ball at

Jaipur, and also at Rehrakole in 21° N. lat.; and Mr. Blanford has obtained it further to the east in the Godaveri valley. Rehrakole appears to be the most northerly locality to which its range has as yet been traced.

Habits.—The gloomy recesses of the forests this Trogon inhabits serve to bring out its beautiful plumage in striking relief; nothing can form a greater contrast than its brilliantly-coloured breast does with the sombre trunks and subdued foliage of the timber-jungles in the south of Ceylon. Were it not for its shyness in taking wing at the sight of man, it would seldom be observed; for it loves to perch across some horizontal limb, many feet from the ground, and there remains utterly motionless, with its head sunk between its shoulders, until the sight of a passing moth rouses it into activity, and it launches itself out with a loud fluttering of its wings, seizes the prey, and starts off to another branch not far distant from its first. It sits bolt upright, and when viewed from behind appears to have no neck and but very little head! The natives of India have named it *Kufni churi*, from this singular appearance, as if dressed in a fakir's "kufni." I have usually found it in pairs, and not solitary, although the two birds are seldom seen close together; but if one be shot the other will almost sure to be seen close at hand. It is this bird which makes the curious monosyllabic note *chok*, which is often heard in the Ceylon forests; for many years I was unable to identify this sound with any species, until I saw a Trogon in the act of uttering it in some dense forest near Ambepussa. It has another purring call, which it commonly utters; but I am not aware that the Ceylonese birds have any querulous note like the mewing of a cat. Mr. Bourdillon says that it gives this out continuously in the Travancore forests. In the recesses of the timber-jungles in the south of Ceylon, considerable tracts of forest may be traversed without seeing or hearing a single bird; as the naturalist is perhaps commenting on the dearth of bird-life, he suddenly comes on a sociable little troop of his feathered friends, who seem to have collected together in these lonely solitudes for companionship's sake: several Forest-Bulbuls (*Criniger ictericus*) and some Black-headed Bulbuls (*Rubigula melanictera*) are sure to be among the assembly, the rest of which is made up with one or two Azure Flycatchers (*Myiagra azurea*) and a casual *Pomatorhinus* leisurely uttering its melodious call as it clings to the mossy bark of some giant trunk, while, lastly, at a little distance from the sociable gathering, sits aloof a solitary Trogon, as if it had come to see what was the matter, but scorned to associate with its lively neighbours. Jerdon remarks that he has sometimes seen four or five of these birds together.

The food of this species consists chiefly of coleopterous insects, bugs (Hemiptera), moths, &c., which it catches on the wing like a Flycatcher; and hence its ordinary name with gentlemen in the Survey Department, and others who frequent the jungle and have made its acquaintance. It is peculiar for the extraordinarily delicate nature of its skin and consequent looseness of the body-feathers, which fall out in abundance on the bird striking the ground when shot. It is on this account that the Trogon is the most difficult of all Ceylonese species to preserve for the cabinet.

I know nothing certain as to its nidification; but a gentleman in the Survey Department assured me that he found a nest with two young ones in a Kitool-palm during the month of May. It was situated in a hole in the trunk of the palm which stood near his hut in the Three Korales, and the young were lying on the hard wood of the nest-cavity.

PICARIÆ.

Fam. BUCEROTIDÆ.

Bill very large, curved from the base, with or without a casque on the upper mandible. Nostrils small, pierced in the bill, without a membrane, at the junction of the casque with the upper mandible or near the ridge. Wings short. Tail long, of ten feathers. Tarsus short. Feet syndactyle; three toes in front.

Tongue short and heart-shaped. Sternum wider at the posterior edge than in front, and with a shallow emargination on each side.

Genus ANTHRACOCEROS.

Bill enormous, curved from the base to the tip; the upper mandible surmounted by a long, high, and sharp casque, its anterior edge projecting forward. Nostrils narrow, situated at the base of the casque; orbital and gular skin nude. Wings short and rounded, the 1st three quills evenly graduated; the 1st short and the 5th and 6th the longest; tertials reaching beyond the primaries. Tail very long, of ten feathers. Legs and feet stout, covered with broad, prominent, transverse scales. Tarsus longer than the middle toe; toes syndactyle, the outer connected with the middle as far as the last joint; sole very broad, claws short and stout.

ANTHRACOCEROS CORONATUS.

(THE CROWNED HORNBILL.)

Buceros coronatus, Bodd. Tabl. Pl. Enl. p. 53 (1783); Blyth, Ibis, 1860, p. 352.

Buceros violaceus, Shaw, Gen. Zool. viii. p. 19 (1811); Blyth, J. A. S. B. 1849, p. 803; Kelaart, Prodromus, Cat. p. 126 (1852).

Buceros malabaricus, Tickell, J. A. S. B. 1853, ii. p. 579; Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. p. 38; Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 260.

Anthracoceros coronata, Reich. Syst. Av. pl. 49 (1849).

Hydrocissa coronata, Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 588 (1856); Cab. et Heine, Mus. Hein. ii. p. 170 (1860); Jerdon, B. of Ind. i. p. 245 (1862); Holdsworth, P. Z. S. 1872, p. 425; Ball, Str. Feath. 1874, p. 387.

Anthracoceros coronatus, Elliot, Mon. Bucerotidæ, pt. iv. (1877).

The Large Hornbill, Kelaart; *The Malabar Pied Hornbill*, Jerdon; *Toucan*, *Double-billed Bird*, Europeans in Ceylon; *Danchuri*, Hind.; *Bagma-dunes*, Bengal.; *Wayera*, Mahrattas; *Peshta-ganda*, Gonds; *Suliman murghi*, lit. "Solomon's Fowl," Musselmen in South India; *Kuchla-kha* in Goomsoor (Jerdon).

Porowa kändetta, lit. "Axe Hornbill" (from the shape of the bill), Sinhalese; *Atta-kändetta*, *apud* Layard; *Errana-chundoo-kuruvi*, Ceylonese Tamils, lit. "double-billed bird" (*apud* Layard).

Adult male. Length 36·0 inches; wing 13·0 to 13·3; tail 13·0; tarsus 2·5; middle toe 2·1, its claw (straight) 0·75; hind toe 1·1, its claw (straight) 0·8; bill from gape to tip across the arc 7·0, casque along ridge 7·5 to 9·5, height of bill with casque 4·0.

Adult female. Length 34·5 inches; wing 12·75; tail 14·0; bill from gape to tip across arc 6·8, casque along the ridge 7·0 to 8·5.

The casque projects back over the crown and gradually becomes compressed to a sharp edge at its anterior part, which recedes downwards to the mandible, joining it about 2½ inches from the tip. The size of the projection forward beyond the point of contact and the consequent angle of connexion depend on age.

Iris crimson; eyelid black; orbital skin and gular region "fleshy;" bill and casque fleshy white; above and beneath the gape, the posterior face of the casque and its anterior three fourths black, the colour *never descending onto the mandible*, and not reaching quite to the anterior edge of the casque; legs and feet blackish leaden colour; edges of tarsal scales whitish, soles yellowish.

In the female the black at the gape does not extend to the upper mandible, nor is the posterior edge of the casque black.

Entirely glossy green-black, except the under surface from the chest downwards, the terminal portion of the secondaries and all but the first two primaries, the three outer tail-feathers, and terminal half of next pair, all of which parts are pure white; base of primaries whitish.

In some examples the tips of some of the tertials are white, as also those of the centre tail-feathers; while the 4th tail-feather is sometimes entirely white, and the corresponding one perhaps of the normal colour.

Young. In the bird of the year the casque is partly undeveloped, the posterior edge is perpendicular, and the anterior portion grades into the bill, the curve of the ridge being continuous with that of the tip. In the second year the anterior projection of the casque begins to develop. The bill is devoid of the black, there being merely a dusky patch at the gape and a slight dark wash near the anterior portion of the casque.

A male shot at Jaffna measures:—wing 12·3 inches; tail 13·2; tarsus 2·5; bill across arc, gape to tip 5·4, along gape 5·5.

A female:—wing 11·8 inches; tail 11·5; tarsus 2·5; bill, gape to tip across arc, 4·85.

The terminal 2 inches of the primaries only are white, while in the adult this colour extends to 3 inches from the tip; on the secondaries the white diminishes to ½ inch on the innermost feather.

Obs. Ceylonese individuals are quite as fine as those from India. Mr. Ball gives the wing of a Chota-Nagpur male as only 11·25 inches, and the bill from gape 6·2. The present species is closely allied to *A. malabaricus*, which has been described under the names of *Hydrocissa albirostris* and *H. affinis*, and frequently referred to by these titles in the writings of Indian naturalists. It differs from the present species in the slightly smaller casque, which has the black patch *extending onto the upper mandible*, and in the coloration of the tail-feathers, the three outer pairs of which have the terminal portions only white instead of being entirely so, as in *A. coronatus*.

Distribution.—This fine Hornbill frequents the wild *dry* jungle-districts of the low country, perhaps ascending into the Haputale range and up the eastern slopes of Madulsima, Medamahanuwara, and the Knuckles to some elevation during the N.E. monsoon. Commencing in the south, its range begins in the Hambantota district, where it is numerous, and, taking in all the forest-country up to Lemastota, extends northward through the eastern and northern portions of the island of Jaffna. Down the west coast it is found as far south as Chilaw and the Seven Korales; but near Kurunegala itself I was unable to detect its presence, although I searched diligently for it. I have seen specimens from the Kurunegala district; but I imagine they must have been killed nearer Puttalam than that place, for Mr. Parker tells me that it is found at Uswewa, but probably does not extend further inland than Nikerawettiya. It occurs throughout the interior of the north-central part of the island, but not so commonly as near the coast, along which it is always more abundant than further inland.

Layard speaks of a second species of Pied Hornbill which he said he saw twice in the hills; he supposed it to be the *Buceros albirostris*, above referred to. On one occasion his collector "Muttu" saw it at Gillymally in forest. As will be seen, the slight differences existing in this species are not such as could ensure its identification on the wing; and I am therefore of opinion that Layard must have met with the immature of the present bird, the peculiar bill of which might have led to the supposed identification of a

new species. I was told by a native superintendent that a large black-and-white Hornbill is seen sometimes in the jungles at the eastern end of the Haputale range; but I have no doubt that it is the present species, which ascends from the low country to the higher jungles during the N.E. monsoon.

Jerdon remarks that the Malabar Pied Hornbill is found in all the heavy jungles of Southern India, and that he met with it in Malabar, Goomsoor, and Central India. It does not seem to be an inhabitant of the hills in the extreme south of the peninsula, where, however, the Great Hornbill (*Homraius bicornis*) is found. Mr. Fairbank records it from Ratnaghiri, near Bombay, and Mr. Ball from Chota Nagpur; the latter writes, "The Malabar Pied Hornbill affects certain localities in Chota Nagpur, where it may generally be found in a flock numbering from 6 to 10 individuals. I have shot it in Manbhum, Singhbhum, and Sirguja, and seen it in the fine jungles which border the Ghât from the Ranchi plateau to Purulia."

Habits.—The Crowned Hornbill lives in small parties, frequenting the tops of trees and feeding on the many fruits with which the Ceylon jungles abound. These it swallows whole, whether large or small. Layard says that to procure its food, "when attached to a branch, it resorts to an odd expedient—the coveted morsel is seized in its powerful bill, and the bird throws itself from its perch, twisting and flapping its wings until the fruit is detached; on this the wings are extended, the descent arrested, and the bird regains its footing."

An individual which Layard kept in captivity was observed to use its bill in recovering its perch in the same manner that a Parrot would do, except that instead of the upper mandible only it employed the whole of the bill to hook itself on by. It is a shy bird, taking wing at once on seeing itself approached; but it usually does not take long flights; when it does the momentum of its huge bill and heavy neck are such as to cause it on alighting to topple forward before gaining its equilibrium. When flying it proceeds with rather quick flapping of the wings, and then sails along with them outstretched, its long tail and motionless primaries giving it a singular aspect. It has a loud harsh note, and is very noisy in the morning and evening, three or four together without much difficulty making themselves heard far and wide. In the jungles of the eastern side of the island it is partial to the tall forest-trees growing on the margins of the rivers, as in the less fertile tracts away from the influence of the water there is not so much means of subsistence for it, except where the iron-wood tree is to be found, the luscious fruit of which attracts to it every fruit-eating bird in the forest. It is likewise very fond of the banyan fruit. Layard remarks that they are often to be seen feeding on the ground; but this I have never been fortunate enough to see myself.

Nidification.—This bird breeds in the cavity of a tree, and the male, as is the case with other species, closes up the entrance while the female is incubating her eggs, leaving a small hole only sufficiently large to admit of his feeding his imprisoned partner. After the young are hatched the mud wall is broken down either by the male or the female, and both assist in feeding their offspring. In the case of the present species we have nothing but native evidence in support of this extraordinary habit; but I think it may well be credited, in the face of what has been seen by reliable witnesses of the nesting of other Hornbills. The natives attribute the cause of this strange proceeding to the birds' fear of the monkeys, which inhabit the Ceylon forests in such numbers: be this as it may, I doubt not that the incarceration actually does take place; and it would be very interesting if some undeniable proof of it could be obtained by observation on the part of some of my readers in the Ceylon Civil Service or the Public Works Department, who, by offering a reward for the finding of a nest in the forests surrounding their Station, might perhaps succeed in making some valuable notes on the subject. I have no information concerning the eggs of the Crowned Hornbill, for they do not appear, as yet, to have been procured.

Genus TOCKUS.

Bill much smaller than in *Anthracoceros*, without the casque, but with the ridge of the culmen sharp and slightly elevated, and with the sides of the upper mandible vertical at the base; the cutting-edge serrated. Nostril basal and round; orbital region wide. Eyelids furnished with stiff lashes. Wings, tail, and feet as in the last genus.

TOCKUS GINGALENSIS.

(THE CEYLONESE HORNBILL.)

(Peculiar to Ceylon.)

Buceros gingala, Wilkes, Encycl. Lond. iii. p. 480 (1808).

Buceros gingalensis, Shaw, Gen. Zool. viii. p. 37 (1811); Temm. Pl. Col. ii. p. 17 (1824); Blyth, Cat. B. Mus. A. S. B. p. 44 (1849); Kelaart, Prodromus, Cat. p. 126 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 260; Schlegel, Mus. P.-B. 1862, p. 12.

Buceros pyrrhopygus, Wagl. Syst. Av. (1827).

Tockus gingalensis, Bonap. Consp. Gen. Av. 1850, p. 91; Jerdon, B. of Ind. p. 250 (1862, in part); Blyth, Ibis, 1867, p. 296; Jerd. Ibis, 1872, p. 5; Holdsworth, P. Z. S. 1872, p. 425; Legge, Ibis, 1874, p. 14, et 1875, p. 282; Elliot, Mon. Bucerotidæ, pt. iv. (1877).

Rhinoplax gingalensis, Bonap. Consp. Vol. Anisod. 1854, p. 3.

Buceros (*Penelopides*) *gingalensis*, Von Mart. Journ. für Ornith. 1866, p. 18.

The Small Hornbill, Kelaart; *Toucan*, Europeans in Ceylon; *The Grey Hornbill* or *Jungle Grey Hornbill.*

Kǣndetta, Sinhalese.

♂ *ad.* suprà sordidè cinerascens, pilei plumis vix brunnescentioribus medialiter albido obscurè lineatis: tectricibus alarum puriùs cineraceis, nigro limbatis: remigibus nigris vix viridi lavatis, primariis ad basin extremam albis, primariis medialiter albo extùs marginatis et albo latè terminatis, secundariis extùs cineraceis angustè albo limbatis, intimis dorso concoloribus: rectricibus centralibus cineraceis, reliquis viridi-nigris, basaliter cineraceis, exterioribus latè albo terminatis: regione paroticâ nigricanti-brunneâ, albido angustè striolatâ: genis et corpore subtùs toto albidis, crisso rufescente: tibiis cineraceis: rostro albido, frontem versùs rufescente, culmine et mandibulâ nigricantibus: pedibus cinereis, unguibus nigris: iride rubrâ.

♀ haud a mare distinguenda.

Adult male and female. Length 22 to 23 inches; wing 8·0 to 8·3; tail 9·0 to 9·5; tarsus 1·6 to 1·7; middle toe 1·3, claw (straight) 0·55; bill, gape to tip, straight 3·9 to 4·3, along culmen 4·3 to 4·4. Expanse 27·0.

Iris red; orbital skin and eyelash black; bill fleshy white in some, with a reddish tinge adjacent to the forehead, the vertical part of the upper mandible black, lower mandible with a blackish patch beneath; legs and feet slaty bluish or greenish plumbeous, claws blackish.

Head and nape reddish cinereous brown, each feather with a pale mesial stripe; ear-coverts blackish brown, with pale centres; back and upper tail-coverts cinereous brown, paling to slaty on the hind neck, and with a slightly rufous cast on the back in some; wing-coverts greyish slate, the feathers margined with blackish; quills black, the outer webs of secondaries mostly slaty, with a still paler edge; terminal portion of 3rd, 4th, 5th, and 6th primaries white; tail greenish black, the central feathers pervaded with a cinereous hue, and the terminal portion of the remainder white; normally this extends to half the feather on the two outer pairs, and decreases on each

succeeding pair; beneath, including the sides of the neck, greyish white, the vent and under tail-coverts rufescent yellowish, and the thighs bluish cinereous.

Young. Birds of the year have a total length of about 20 to 21 inches; wing 7·7 to 7·9; bill from gape to tip (straight) 3·2 to 3·6.

The bill is shaped somewhat differently from the adult, inasmuch as the perpendicular lateral portion extends forward until it meets the margin; with age the upper edge of this "wall" disappears, leaving only about ¾ inch of this part at the base of the mandible.

Iris red; bill black, usually a white stripe of greater or less extent on the wall of the bill, and in some with patches of the same on the lower mandible; legs and feet bluish brown.

Head and hind neck darker than in the adult; under tail-coverts perhaps, as a rule, more rufous.

Obs. The amount of black even on the bill of the adult varies slightly. In the young stage this bird was thought by Layard to be perhaps a different race; he had only procured specimens in one district, viz. the south, which coincidence, I suppose, strengthened his belief as to there being two species in the island. I was, at one time, inclined to think that he might perhaps be correct in his supposition, basing my ideas, however, on a difference of size in the bill; but a good series, afterwards collected by me, demonstrated both the cause of the black bill and the variability in size of that of the adult. The development of white in some specimens is more than in others; in certain individuals the penultimates may both be entirely white, while one of the primaries in others may be similarly coloured.

Tockus gingalensis is allied to the South-Indian *T. griseus*, which Jerdon confounded with it in his notice of the Indian bird (*loc. cit.*). The latter has the plumage more of a brownish grey than a slate-colour; the bill is reddish at the base, paling to yellowish at the tip; the orbital skin is purplish.

Tockus griseus has not yet been detected in Ceylon.

Distribution.—This Hornbill, commonly known, as is also the last, by the name of Toucan, is an inhabitant of most of the tall forests and heavy jungles of the low country, ascending the mountains of both the Central and Southern Province, in the former of which I have met with it at an elevation of 4000 feet. It is plentiful throughout the northorn forests, and Mr. Holdsworth found it inhabiting the scrub-country round Aripu.

I do not know that it has been detected in the Jaffna peninsula, but it may possibly be found in the jungles near Elephant Pass. Passing over the Seven Korales and the Puttalam district, in which it is tolerably plentiful, we find it in the forests about Ambepussa and Avisawella, in the Raygam and Hewagam Korales, in Saffragam, the Pasdun and Kukkul Korales, and in the jungles between Galle and the "Haycock." In the forest of Kottowe I never failed to notice it whenever I visited that place. In the Wellaway Korale and the Friars-Hood Hills it is likewise tolerably frequent. As regards the Kandyan Province I think it is commoner in Uva than elsewhere; I have seen it from the Knuckles district, and have been told that it has occurred in the main range at Kandapolla; to such an elevated region, however, I should say it could only be a straggler during the dry season, unless, indeed, it be a resident in Udu-pusselawa, from which it would naturally extend to the jungles above the Elephant Plains.

Habits.—The Ceylonese Hornbill is a shy bird, frequenting the tops of tall trees, and rarely descending into the low jungle beneath them. In the lofty timber-forests of the south and west, therefore, it is difficult to procure; but in the north, where the jungle is of altogether a different character (thick, with rather low trees), it may easily be shot, as the dense wood conceals the sportsman, and the distance of the bird from him is much less than when it is feeding in the top of some noble Keena-tree, or *ka*ing in the upper branches of a gigantic Hora. It generally consorts in troops of five or six and is very noisy, its note being a loud laugh, commencing with the syllables *kā-kā-kā*, slowly uttered, and then quickening into *kakakaka*. In the early morning it roams about a good deal in search of fruit, but after feeding is not much on the wing. Its flight, like that of the last species, is laboured and slow; it is a combination of flapping of the pinions and quick dips, particularly when descending to alight on a tree. Its diet consists mainly of fruit, that of the Banyan, Bo, wild cinnamon, and Dawata (*Carallia integerrima*) being much in favour with it; it also devours reptiles and insects, for I have found green lizards and scorpions in the stomachs of some individuals. Its flesh is tender and not distasteful, and when subjected to the usual jungle-test (curry), makes a meal which the hungry hunter is far from despising; on such occasions it is always in great demand with one's Cingalese and Tamil servants.

I have never been able to procure any information concerning its nesting beyond the native assertion that it breeds in hollow trees like the last species.

The figures in the Plate represent an adult in the foreground, and an immature bird (placed by the artist, failing a knowledge of its habits, upon a cocoanut-tree) in the background. The feet and legs, I regret to say, have been coloured much too dark.

PICARIÆ.

Fam. UPUPIDÆ.

Bill very slender, long, and curved from the base. Wings rounded. Tail moderately long, even or rounded at the tip. Tarsi short. Feet with three toes in front and one behind. Tongue small and heart-shaped. Sternum with either a notch on each side of the posterior edge or a foramen in place of a notch.

Subfam. UPUPINÆ.

Bill more slender and longer than in *Irrisorinæ*. Wings with ten primaries. Tail with ten feathers. Tarsus shielded in front with broad transverse scales.

Sternum with an open notch on each side of the posterior edge. Head crested.

Of terrestrial habits.

Genus UPUPA.

Bill typically long and slender, much compressed; gape rather wide. Nostrils round, partially concealed by the plumes. Wings with the 4th quill the longest, and the 1st a little more than half the length of the 4th. Tail even. Tarsus equal to the middle toe without the claw. Outer toe joined to the middle one at the base, and considerably longer than the inner; hind toe equal to the inner one, its claw long and straight.

Crest very large and deep.

UPUPA NIGRIPENNIS.

(THE SOUTH-INDIAN HOOPOE.)

Upupa nigripennis, Gould, MS.; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 725 (1856); Jerdon, B. of Ind. i. p. 392 (1862); Holdsworth, P. Z. S. 1872, p. 435; Hume, Nests and Eggs, p. 163 (1873); Legge, Ibis, 1875, p. 286; Hume, Str. Feath. 1876, p. 458.

Upupa senegalensis, Blyth, Cat. B. Mus. A. S. B. p. 46 (1849); Kelaart, Prodromus, Cat. p. 119 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 174.

Upupa ceylonensis, Reich. Handb. Scansoriæ, p. 320. no. 753, tab. 595. fig. 4036 (1851).

Upupa indica, Sharpe & Dresser, B. of Europe, pt. vii. *U. epops*, p. 6 (1871).

Hudhud, Hind.; *Kondeh pitta*, lit. "Crested Bird," also *Kukudeu guwa*, Telugu.

Chaval kuruvi, lit. "Cock Bird," Tamils in Ceylon.

Adult male. Length 10·8 to 11·75 inches; wing 5·1 to 5·5; tail 3·5 to 4·0; tarsus 0·85 to 0·9; middle toe and claw 0·85 to 0·95; bill from gape (straight) 2·1 to 2·56.

Female. Length 10·25 to 10·8 inches; wing 4·7 to 5·0; bill to gape 2·0 to 2·2.

Iris brown; bill black, pale brown at the base of upper mandible, fleshy red at the base of lower; legs and feet pale slate-blue or plumbeous, in some tinged with brown.

General hue of head, crest, hind neck, and throat fine cinnamon-brown, becoming smoky brownish on the interscapular region, and pale vinaceous on the fore neck and chest; crest-feathers, which are about 2 inches in length, with a terminal black bar and *occasionally* a *pale* adjacent patch; back, upper tail-coverts, tail, and wings black; the lower part of back crossed with white, and the rump entirely so; an angular bar across the centre of the tail, a broad band across the terminal portion of primaries (the first excepted), three on the secondaries, and another on the median coverts and scapulars white; 1st primary sometimes with a white spot, at other times without; tertials with white edges, an oblique streak across the inner webs and another down the centre from the base, the light parts often deeply tinged with buff; the point of the wing concolorous with the hind neck; beneath, from the upper breast, white, dashed on the belly in some, and in others on the sides only, with blackish mesial streaks; under wing pale cinnamon-red.

Young. The nestling is covered at first with pure white down, which is quickly interspersed with feathers of the normal colour, the crest showing at once.

Obs. In Ceylonese examples of this Hoopoe, a great variety in the depth of coloration is met with; this is particularly noticeable on the head and hind neck; again, scarcely any two specimens have the lower parts striated alike or the tertials similarly marked; the spot on the 1st primary is sometimes absent, and may perhaps be a character of nonage. I have noticed that the largest individuals that I have met with are the palest in colour and always have the white spot on the 1st primary. It is the exception to find an example with the *whitish* or *pallid* bar anterior to the black tips of the crest-feathers; but notwithstanding it does exist, though it is not so white as in examples from northern parts of India—the race, *U. indica*, of the European bird; and it is in the form of a marginal spot at each side of the shaft, the web next to which is of the same colour as the rest of the feather. The length and shape of bill cannot be relied upon at all as a characteristic of this Hoopoe; some are tolerably straight, others much curved; some long, others short.

The North-Indian variety (*Upupa indica* of Hodgson), if it be considered distinct from the present, has more white (and has it more constantly) at the edge of the black crest-bar; Hodgson's type was collected in Nepal, and the race it represents seems to me worthy of being considered intermediate between the present species and *U. epops*. Specimens from "North Bengal," in the British Museum, have the pale heads of the European bird; but they are longer in the bill than the generality of the latter, and the light patch anterior to the black tip is not so white; two examples have the wings 5·6 and 5·1 inches, and the bill to gape 2·4 and 2·3 respectively. In *U. epops* the bill is variable in length, but its pale plumage and white covert-bar make it very distinct from the North-Indian bird, than which also it has a longer wing.

As to the Ceylonese bird, it is *identical*, in all respects, with specimens I have examined from Mysore, which represent the true *nigripennis* of Gould.

The Burmese form (*U. longirostris*, Jerdon) has not got a longer bill than Ceylonese specimens often have; it has the white spot on the quill which I have shown to exist in the latter, although this is a worthless character in the present species, its absence in specimens which Jerdon handled probably causing him to err in saying that the species wanted it; this, however, was afterwards corrected by him in the 'Ibis,' 1872, p. 22. Both species want the *white* on the hinder crest-feathers; and examples of each may, I think, be found equally dark as to their rufous coloration; I therefore imagine that the two races are scarcely separable.

Distribution.—The Indian Hoopoe is an inhabitant of many of the dry districts in Ceylon. It is very common both in the north and south-east of the island. In the former district it spreads from the Jaffna peninsula down the west coast as far as the neighbourhood of Puttalam. I have seen it in the island of Manaar; and Mr. Holdsworth says that it is very abundant at Aripu during the winter months, its numbers being largely increased about October. In the south-east it is common throughout the year between Hambantota and Yāla, and likewise in portions of the Park country and the Eastern Province. I found it in August on the patnas near Bibile, at the foot of the Madulsima range. It is not unfrequent in Uva, and occurs occasionally on the Elephant and Kandapolla plains and at high elevations in Maturata. I am indebted to Col. Watson for the possession of an example which he shot at Kandapolla in May at an elevation of 6300 feet; and he informs me that he has often seen it in that locality. It is sometimes found in Dumbara, straying thither, in all probability, up the valley of the Mahawelliganga from the low country of Bintenne. Near this locality I have met with it at Minery Lake; but I never saw it nearer Trincomalie than this, although it may possibly visit the plains in the delta of the Mahawelliganga.

Layard writes that he procured a solitary specimen at Colombo; but any occurrence of it in that neighbourhood, or anywhere south of Chilaw, must be looked upon as that of a straggler down the west coast. It has never been found in the south-west.

Jerdon writes of this species that it "is found throughout Southern India, extending through part of Central India to the North-west Provinces and the Dehra Doon." Whether the examples from the latter locality really belong to this species or to the race *U. indica*, I am unable to say. In the Khandala district Mr. Fairbank says it is common, and Burgess writes of it as the same in the upper portion of the Deccan. Mr. Adam speaks of it as "not common" in the Sambhur-Lake district, and Captain Butler writes the same of it in the Guzerat region; but these birds, I imagine, probably pertain to the intermediate form. From Sindh, Mr. Hume remarks that he has never seen it. In the extreme south of India it appears to be chiefly restricted to the east coast; for it is found in the island of Ramisserum, and Mr. Fairbank observed it in the lower Palanis, whereas I find no record of it in Mr. Bourdillon's list of the birds of Travancore.

The Burmese race, *U. longirostris*, is common in the plains of Pegu throughout the year, but is, according to Mr. Hume, most numerous in February and March. In the Irrawaddy delta, Dr. Armstrong found it very abundant in open country. Swinhoe found it at Hainan, in China, and records it from Siam.

Habits.—This charming bird frequents, in the island of Ceylon, open sparsely-timbered ground, scrub-dotted plains, cultivated fields, dry grazing-land in the jungles of the interior, and patnas in the Central Province. In its nature it is a tame bird, and when scratching for insects, with its handsome crest depressed, allows a near approach before taking flight; when flushed it does not usually fly far, but takes refuge in a neighbouring tree, where it will sit quietly, giving out its soft and melodious call, *hōō-poo, hōō-poo,* accompanied by a movement of its handsome crest and an oscillation to and fro of its head at each note. In Jaffna it may be seen close to the houses of the English residents, and I have known it breed in the garden of a bungalow within a few yards of the verandah. It feeds entirely on the ground, strutting about with an easy gait, and scratching vigorously for insects in dry soil. It often scrutinizes the odure of cattle, beneath which it finds an abundance of food.

In India Jerdon remarks that it frequents "old deserted buildings, such as mosques, tombs, and large mud walls;" he found its food to consist of ants, Coleoptera, and small grasshoppers. Burgess says that in the Deccan it affects sandy plots of ground outside the walls of villages, where the ground is perforated with the conical holes of the ant-lion, on the larvæ of which it feeds.

There is something very striking in the soft tone of this bird's note when heard amidst the chatter and chirping of the numerous Passerine birds which inhabit the Ceylon coast-jungles. Though perhaps uttered tolerably close to the listener it seems to be wafted on the mild sea-breezes from afar off, and tends to rivet the sportsman's attention as he is returning to his bivouac beneath the already burning rays of an 8 o'clock sun, after a long morning's shooting in the parched-up scrubs of the northern coast. The flight of this Hoopoe is buoyant but undulating, and when pressed it is able to show considerable powers of wing, for in India a trained Hawk is said generally to fail in seizing it.

Nidification.—The breeding-season in the north of Ceylon lasts from November until April, and possibly a second brood may be reared later on in the year, as Layard mentions the shooting of young birds in August. It breeds in holes of trees, showing, in this respect, as well as in points of anatomy, its affinity to the last family, the Hornbills. It sometimes, however, chooses a hole in a wall, in which I have known it to nest in the garden of an English residence in the Jaffna fort. Burgess writes, with reference to its habit of building in walls in India, "it breeds in the middle of April and May, constructing its nest in holes in the mud walls which surround the towns and villages in the Deccan." The nests are composed of grass, hemp, and feathers. In the same district a nest made of soft pieces of hemp was found in a fort wall. Miss Cockburn, again, tells us that at Kotagherry it selects holes in stone walls and in earthern banks to build in, making a mere apology for a nest of a few hairs and leaves, which in a short time has a most offensive smell. This, it is asserted, arises from the oily matter secreted by the sebaceous gland on the tail-bone, which in the female at the breeding-time assumes an intolerable stench, whence obtains the idea, according to Jerdon, that the bird constructs its nest of cowdung.

Mr. Holdsworth found one in a hole in a small mustard-tree (*Salvadora persica*) at Aripu; the young were reposing on the bare wood at the bottom of the cavity. The same fact has been noticed by Indian observers, viz. that when holes in trees are resorted to no nest whatever is constructed.

The eggs vary from three to seven, five or six being the usual number. Mr. Hume writes that they "are commonly a very lengthened oval, almost always a good deal pointed towards one end, and sometimes showing a tendency to be pointed at the other end too—a most remarkable form of egg, which I cannot recall having observed in any other species . . . . When quite fresh they are of a pale greyish-blue tint, but many are of a pale olive-brown or dingy olive-green, and every intermediate shade of colour is observable. As a rule they have scarcely any gloss at all, and of course are devoid of markings. In length they vary from 0·9 to 1·05 inch, and in breadth from 0·65 to 0·73 inch."

Fam. CORACIIDÆ.

Bill large, wide at the base, more or less curved and the tip hooked. Legs and toes covered with strong scuta.

Sternum with two emarginations of variable depth in the posterior margin.

Plumage gay, especially on the wing; feathers of the body with an axillary plume.

PICARIÆ.

CORACIIDÆ.

Subfam. CORACIINÆ.

Bill variable in length and width. Wings moderately long. Tarsus shorter than the middle toe.

Genus CORACIAS.

Bill long, broad, and high at the base, from which the culmen is gradually curved to the tip, which is bent down. Nostrils basal, oval, and oblique; gape armed with short strong bristles. Wings long, the 3rd and 4th quills subequal and longest, the 1st longer than the 6th. Tail moderately even. Legs and feet robust. Tarsus subequal to the outer toe, and covered, as well as the toes, with strong transverse scales; inner toe much shorter than the outer, and slightly exceeding the hind one; claws strong, moderately straight.

CORACIAS INDICA.

(THE INDIAN ROLLER.)

Coracias indica, Linn. Syst. Nat. i. p. 159 (1766); Gmelin, Syst. Nat. i. p. 378 (1788); Sykes, Cat. Birds Deccan, J. A. S. B. 1834, iii. p. 541; Blyth, Cat. B. Mus. A. S. B. p. 51 (1849); Kelaart, Prodromus, Cat. p. 118 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 171; Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 571 (1856–8); Jerdon, B. of Ind. i. p. 214 (1862); Holdsworth, P. Z. S. 1872, p. 423; Hume, Nests and Eggs, p. 103 (1873); id. Str. Feath. 1873, p. 167; Butler, ibid. 1875, p. 456; Morgan, Ibis, 1875, p. 314; Bourdillon, Str. F. 1876, p. 382; Fairbank, ibid. 1877, p. 394.

Coracias bengalensis, Linn. Syst. Nat. i. p. 159 (1766).

Garrulus nævius, Vieill. N. Dict. d'Hist. Nat. xxix. p. 431 (1819).

Rollier de Mindano, Buffon, Pl. Enl. pl. 285; *Blue Jay from East Indies*, Edwards, Glean. pl. 326 (1764); *Blue Jay* or *Jay*, Europeans in India and Ceylon.

Subzak, lit. "Greenish bird;" also *Nilkant*, lit. "Blue Throat," Hind.; *Tas*, Mahratta; *Pálú pitta*, lit. "Milk-bird," Tel.; *Katta-kade*, Tamul; *Towe*, Mahri (Jerdon).

Doong-kowluwa, lit. "Smoke-bird," Sinhalese; *Panang karda*, Tamils, North Ceylon; also *Kotta-killi*, lit. "Palmyra-Parrot," *apud* Layard.

Adult male and female. Length 12·5 to 13·2 inches; wing 6·9 to 7·1; tail 4·6 to 4·9; tarsus 0·9 to 1·0; middle toe 1·0, its claw (straight) 0·38; bill to gape 1·8 to 2·1. The bill appears to vary in length without regard to size.

Male. Iris grey or yellowish grey, with a rufescent brown inner circle, orbital skin and eyelid dull orange-yellow; bill black or blackish, paling to reddish at base beneath; legs and feet olivaceous yellow or smoky yellow, claws brownish.

Head dusky bluish green, brightening above and behind the eye to turquoise-blue; above the nostril the forehead is greyish yellow, with a tinge of violet in some; lower hind neck, interscapular region, and scapulars dull brownish green, separated from the blue of the nape by a vinous collar; lower back cerulean blue; upper tail-coverts, base and terminal portion of all but centre rectrices, least wing-coverts, greater part of primaries, and terminal half of secondaries deep violet-blue, with a brilliant cobalt lustre close to the shafts and at the edge of the wing-coverts; central rectrices dusky green, with a blue wash at base; a broad band across the remaining rectrices, another across the six outer primaries, primary-coverts, and bases of secondaries pale cerulean blue.

Lores tawny brown; beneath the eye and the ear-coverts vinous-brown, with whitish mesial streaks; throat and chest pale greyish vinous, the feathers with mesial buff lines, and broadly margined on the fore neck and upper part of chest with purple-violet; beneath, from the chest, with the under wing, pale greenish blue.

Young. Iris brown, the grey outer portion in the adult reduced to a narrow ring; this latter increases with age very gradually, imparting considerable variation to the eye; bill blackish brown, pale or reddish at the base beneath; tarsus slightly tinted with olivaceous; gape yellowish.

Head and back duskier than in the adult; forehead with more of the pale colour; band across hind neck fawn; lesser wing-coverts (in the nestling) almost concolorous with the back; chin and throat paler than in the adult, the purplish lilac on the latter faint.

Obs. Ceylonese examples average, I think, smaller than Indian. Two of the latter from Kamptee measure 7·1 inches in the wing; another 7·4—the former being the maximum limit (according to my experience) of the insular bird. The lilac tints show considerable variation in continental as well as in Ceylonese specimens, the depth of tint depending on age.

Distribution.—The Roller has a peculiarly local distribution in Ceylon, dwelling in the dry portions of the island, and migrating to the damp district of the west chiefly during the dry season (N.E monsoon). Its head-quarters may be said to be the Jaffna peninsula, the open portions of the northern sea-board, and certain parts of the interior of the Northern and N.W. Provinces. In these districts it is common in many places and absent from others. Neither Mr. Holdsworth nor myself observed it in the Aripu district, but on the adjacent island of Manaar it occurs. To the south of the jungles bordering the coast of the Bay of Kalpentyn it is not uncommon. I have seen it in the Kalpentyn peninsula itself, and about Puttalam and Chilaw it is a well-known bird. It is a resident as far south as Madampe, and likewise in the region between that and Kurunegala; but below this line it occurs chiefly as a straggler between the months of October and March. In this season it may often be seen about Veangodde and Ambepussa, and I have procured it in the Hewagam Korale, a little to the south of Colombo, in July. I doubt, however, if it resides in that district. I have never seen or heard of it to the south of the Kaluganga, nor did I meet with it in the very likely country between Haputale and Hambantota. It may occur in the Eastern Province, but I have no information to that effect. In the Trincomalie district it is now and then seen from December to February; but a little inland, about Ratmalie, it is common enough. Eastward of this point, through the centre of the island, it musters, as above remarked, strongly, confining itself, of course, to open districts, fields surrounded by the village tanks, and dried-up paddy-land. Even here, however, it is local; for although it is common near Hurullé, I have never seen it about Haborenna, which is separated from the former place by a tract of forest.

It has been found now and then in the valley of Dumbara, but I do not know that it occurs elsewhere in the Kandyan country.

On the mainland this species is found throughout nearly all India, from the extreme south to the Himalayas; it does not extend into Burmah, being there replaced by the closely-allied race *C. affinis*. The two forms blend into one another in such a gradual manner that it is difficult to say where *indica* ends and *affinis* begins. Mr. Hume remarks of Mr. Inglis's specimens from N.E. Cachar, that "they are not very typical, but that they are nearer to typical *affinis* than to *indica*." Its range is not by any means so limited towards the north-west; for in that direction it extends through Persia to Asia Minor, mingling thus with its European ally *C. garrula*. Mr. Danford observed it in Asia Minor at the base of the Aladagh mountains; and Messrs. Sclater and Taylor have seen a specimen in the Museum of the American College at Constantinople which was shot on the Asiatic side of the Bosphorus.

Returning to India we find that it is a seasonal visitant to some parts of the country, perhaps avoiding the extreme temperature of the hot season. It is said to leave the Deccan about the middle of April; and Captain Butler notices that it quits the hills at Aboo during the hot season, although the singular fact is testified to that it remains in the plains at that time. In the wooded and cultivated portions of Sindh, Mr. Hume observes that it is common, but absent from the desert tracts; he further remarks that it is in the Terai between Darjiling and in Eastern Bengal that the two races *indica* and *affinis* first commence to intermix.

Habits.—In Ceylon the "Jay" is found in open compounds, cocoanut-groves, tobacco-fields, waste scrubby land, grass-fields near the borders of tanks, and also newly cleared spaces in the forest. It perches on some bare tree, fence, or other prominent object, and sallies out after insects, which it captures cleverly on the wing, either returning to its original post or taking up another close by to devour its quarry. It is fond of perching on cocoanut-fronds, and in the Jaffna district often selects the lofty well-whips used to draw the water for irrigating the native tobacco, and presents a striking appearance with its head drawn into its shoulders and its bright plumage glistening in the sun. It is generally difficult of approach, flying from one fence or stump to another before one can get within shot of it; and when fired at, if not hit, flies off, mounting above the tree-tops and rolling from side to side in its course as if it had a difficulty in balancing itself on the wing. However much it is alarmed it generally returns to the field from which it has been chased, making a wide detour and reappearing perhaps at the opposite end from that at which it left. When the ripe paddy has been cut in the fields round the village tanks the Roller is sure to be seen taking his part in the harvest-making, which consists in consuming as many of the newly exposed terrestrial insects as it can, and flying in the meanwhile from one haycock to the other. Grasshoppers and beetles at such times form its chief diet. Its harsh cry is often uttered when it has been shot at and wounded, it being one of the few birds I have ever met possessed of this singular habit.

Its flight is performed with vigorous flappings of the wings, the points of which appear almost to meet beneath its body while it turns or rolls about in that strange manner which has acquired for it its peculiar name. It varies its course in the air by darting off sometimes at right angles to the original direction and then almost tumbling over in rapidly descending to the ground. These extraordinary evolutions it performs to some purpose when flown at by the Turumti, or Red-headed Merlin, mention of which I have already made at page 112.

Jerdon has some interesting notes on this handsome bird which I subjoin here. He writes, in his 'Birds of India':—"It is often caught by a contrivance called the *chou-gaddi*. This consists of two thin pieces of cane or bamboo bent down at right angles to each other to form a semicircle and tied in the centre. To the middle of this the bait is tied, usually a mole-cricket, sometimes a small field-mouse (*Mus lepidus*). The bait is just allowed tether enough to move about in a small circle. The cane is previously smeared with bird-lime, and it is placed on the ground not far from the tree where the bird is perched. On spying the insect moving about down swoops the Roller, seizes the bait, and on raising its wings to start back one or both are certain to be caught by the viscid bird-lime. By means of this very simple contrivance many birds that descend to the ground to capture insects are taken, as the King-Crows (*Dicruri*), Common Shrikes, some Thrushes, Flycatchers, and even large Kingfishers (*Halcyon*) . . . .

"The *Nilkant* is sacred to Siva, who assumed its form; and at the feast of the Dasseragh, at Nagpore, one or more used to be liberated by the Rajah, amidst the firing of cannon and musketry, at a grand parade attended by all the officers of the station.

"Buchanan Hamilton states that before the Durga Puja the Hindoos of Calcutta purchased one of these birds, and at the time when they threw the image of Durga into the river, set the *Nilkant* at liberty. It is considered propitious to see it on this day, and those who cannot afford to buy one discharge their matchlocks to put it on the wing. The Telugu name of the Roller, signifying Milk-bird, is given because it is supposed that when a cow gives little milk if a few of the feathers of this bird are chopped up and given along with grass to the cow the quantity will greatly increase. It is one of the birds on whose movements many omens depend. If it cross a traveller just after shooting it is considered a bad omen."

The Roller is very tenacious of life, requiring a large amount of hitting before coming to earth.

Nidification.—In Ceylon the Roller breeds from January until June, chiefly rearing its young about March. It nests in holes in trees, one which Mr. Parker found being situated in a palm-tree, and contained 3 white eggs, much resembling those of *Halcyon smyrnensis.* Mr. Hume writes :—"They build in hollow trees, in old walls, in roofs, or under the eaves of bungalows ; they sometimes make a good deal of a nest of feathers, grass, &c., especially when the site they choose is not well closed in ; but when they build in a small-mouthed hole there is usually a very scanty lining. I *have* found the nest in a large niche in an old wall, in which the birds had contracted the entrance with masses of torn vegetable fibre and old rags ; but this is quite exceptional ; and, again, I have taken the eggs from a hole in a Siris-tree, in which there was not the slightest lining beyond a few fragments of decayed wood. I have never found more than five eggs in any nest, and four I take to be the normal number . . . . The eggs are very broad ovals, in some instances almost spherical and like those of the Bee-eater's ; they are of the purest china-white and highly glossy. The average of a large series of measurements is 1·3 by 1·06 inch."

Genus EURYSTOMUS.

Bill very broad at the gape, shorter than the last, much curved, abruptly so at the tip. Nostrils oblique and narrow ; rictal bristles absent. Wings longer than in the last genus ; 2nd quill the longest, the 1st slightly shorter. Feet differing from those of *Coracias* by having the outer toe slightly joined at the base to the middle one.

EURYSTOMUS ORIENTALIS.

(THE INDIAN BROAD-BILLED ROLLER.)

Coracias orientalis, Linn. Syst. Nat. i. p. 159 (1766).

Eurystomus orientalis, Steph. Gen. Zool. xiii. p. 99 (1826); Blyth, Cat. B. Mus. A. S. B. no. 220, p. 51 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 171; Horsf. & Moore, Cat. B. Mus. E. I. Co. no. 148, p. 121 (1854); Jerdon, B. of Ind. i. p. 219 (1862); Holdsworth, P. Z. S. 1872, p. 423; Hume, Str. Feath. 1874, p. 164; Morgan, ibid. p. 531; Bourdillon, ibid. 1876, p. 382.

Eurystomus cyanicollis, Vieill. N. Dict. d'Hist. Nat. xxix. p. 425 (1816).

The Oriental Roller (Horsfield); *Tiong Batu*, Sumatra (Raffles); *Tihong Lampay*, Malay.

Adult male and female. Length (from skin) 11·0 to 12·0 inches; wing 7·2 to 7·5; tail 3·7 to 3·9; tarsus 0·75; middle toe 0·85, claw (straight) 0·35; bill to gape 1·5.

The above are from 3 Ceylonese examples. A Nepaul bird in the British Museum measures, wing 7·4 inches; another from Labuan, wing 7·3 inches.

Iris hazel-brown; bill deep orange-red, the tip of the upper mandible red; orbital skin red; tarsi and feet orange-red; feet duskier than the tarsus.

Head, face, and chin brown, darker in some adults than in others, and slightly suffused with greenish on the nape, which passes into the opaque leaf-green of the hind neck, back, least wing-coverts, tertials, and rump; median and greater wing-coverts greenish blue, blending into the duller hue of the lesser coverts; primary-coverts, primaries. and secondaries black, washed on the outer webs and on the inner just inside the shaft with ultramarine; a broad band of pallid cerulean blue extending from the inner web of the 1st primary to the outer web of the 7th, and tinging the surrounding ultramarine at the point of contact; tail black, the feathers washed with ultramarine at the edges, and the reverse part beneath, except near the tip, blue; centre of the throat cerulean blue, blending into the obscure greenish blue of the fore neck and under surface; the centre of the breast and abdomen verditer-blue; under wing-coverts concolorous with the breast.

The above description is from Ceylonese examples. One from Nepal has the head and hind neck darker, and the blue colour of the breast not so bright; another is very similar to the Ceylonese birds, but has the back and wings more sombre, the wing-bar smaller (its hue spreading down the outer edges of the quills in the form of an edging), and the under surface much greener.

Young. Mr. Hume writes of the immature bird that the bill, which is much smaller than in the adult, is almost black, with the gonys pale orange, which gradually deepens in colour with the age of the bird and spreads over the whole mandible, the upper mandible becoming reddish black, after which the orange hue spreads from the gape over the whole upper mandible except the tip.

An example which I have examined from the Andamans is paler on the head and neck than an adult; the feathers of the upper surface are slightly pale-edged; chin and along the base of the under mandible brown; a portion of the throat tinged with hyacinth-blue, the rest greenish blue, and the feathers pale-tipped, with a faint tinge of the hyacinth hue on the centres of many. The under parts are paler than in the adult, and the feathers of the chest tipped with a light colour.

Obs. This is a variable species in colour, which character is no doubt due to the age of respective individuals: one example from Labuan corresponds with Ceylonese and Indian ones; it is slightly more nigrescent on the hind neck and interscapulars, and the blue of the throat is more extensive. Another from the island of Negros and one from Java are also not to be separated.

Eurystomus pacificus, of which I have examined specimens in the national collection from Ceram and the Sula Islands, is closely allied to *E. orientalis.* The wings of three specimens measure 7·8, 7·8, and 7·5 inches respectively. The upper surface is greener, the under parts paler, and the throat less coloured with blue than in *E. orientalis*; the basal outer margins of the tail-feathers are tinged with greenish blue. A Sula-Island individual, however, has

the threat quite as blue as a Ceylonese; and a Pinang example has a slight inclination towards the greenish edging of the caudal feathers. It would seem that there are connecting-links between the two species.

Distribution.—This handsome Roller is, almost without exception, the rarest resident form in Ceylon. I conclude that it *is* resident, as the only two specimens I have ever met with, and both of which I failed in shooting, were seen during the south-west monsoon. One was at Maha-oya, on the new Batticaloa Road, and the other in Mr. Chas. de Soyza's timber-forest at Kurnwite, near Ratnapura. Layard remarks that but three specimens fell under his notice, one of which he killed in the Pasdun Korale, and the other two near Gillymally. In the British Museum is an example from the collection of Mr. Cuming; but the precise locality is not stated. Another example was shot some years ago near Kandy, and preserved by Messrs. Whyte and Co. In addition to these instances of its capture I am indebted to Mr. Delaney, of the Kirimattie Estate, near Kadugannawa, for an account of three or four birds which visited the neighbourhood of his bungalow for several days at the close of 1875, and after remaining about some tall trees, disappeared again; from his description of these visitors, and observations which he made on their habits, they must have belonged to the present species.

In Southern India it appears to make its appearance in certain localities and then disappear again. Mr. R. W. Morgan says that it is by no means rare in the Malabar forests, and he procured several specimens at Nellumbore. Captain Vipan observed it near the foot of the Carcoor Ghât of the Nilghiris; Mr. Bourdillon remarks that it is nowhere abundant in the Travancore hills, and that it is, he thinks, only a visitor; he has observed it "in August, during the winter months, in April, and as late as May." Regarding its distribution in the northern parts of India and elsewhere, Jerdon writes (*loc. cit.*) that "it is found at the base of the Himalayas in Lower Bengal, Assam, and the Burmese countries, extending to Malayana and China;" and he further remarks that it is said to visit Central India in the cold weather. In Cachar, Mr. Inglis says it is not uncommon and is a resident in that district; Mr. Oates records one specimen as being brought to him from the Arrakan hills, and remarks that it occurs rarely in Pegu. From Tenasserim Mr. Hume notices it as procured by Mr. Davison; this gentleman writes to Mr. Hume that in the Andamans it is comparatively common about Fort Mouat, Mount Harriet, and other wooded places; it has also been procured about Port Blair from December until April.

I have already remarked that specimens are in the British Museum from Pinang, Java, and Labuan, and there is likewise an example from Negros, in the Philippines, which I cannot separate from Indian. It is said to occur in Sumatra. Concerning Chinese individuals, the late Mr. Swinhoe writes ("Cat. Chinese Birds," P. Z. S. 1871, p. 347) that they do not agree quite with specimens from Java, India, and Lombok; and therefore they are, as suggested by Blyth, referable to the nearly allied *E. pacificus.*

Habits.—On both occasions that I met with this species, it was frequenting lofty dead trees, on the outermost branches of which it was perched. On the Maha-oya, the individual which I attempted to shoot flew out of the tree and returned at once to its perch, which, being at the top of an enormous tree, was beyond the range of my shot, and on my firing a second time it flew off into the forest. In the distance it has the appearance of a short-tailed Nightjar when perched, its short neck and broad bill giving it a curious outline. Its flight has the same peculiar swerving or rolling character as that of the last genus, but in a modified degree. Layard shot all his specimens in the act of tearing away the decayed wood round holes in trees; they clung to the bark after the manner of Woodpeckers, and were probably seeking a situation to nest in; he found their stomachs full of wood-boring Coleoptera, swallowed whole, and he observed that they beat their food against the bark before swallowing it. It is entirely a forest species, and is only found in regions which are well-wooded throughout. Mr. Morgan writes that in the Malabar forests it may frequently be seen perched on a lofty bamboo in the neighbourhood of some forest-stream, and that it is an exceedingly silent bird, sitting for hours together on a twig, occasionally taking a short flight after some passing insect, but almost invariably, unless disturbed, returning to the same perch. Blyth had one, which he kept in confinement for some time, and which displayed the somewhat abnormal propensity of eating plaintains; it devoured them eagerly, and would fly to him for one when he had it in his hand. The experience of Messrs. Motley and Dillwyn of it in the Malay Islands was that it is a most active and lively bird, haunting very tall jungle in parties of five or six

together; these fly rapidly in large circles with quick strokes of the wing, like Woodpeckers, frequently swooping down upon one another with loud chattering. When perched, their note is a single, full, deep-toned whistle, or something between that and the sound "*you*" when uttered with forcible expulsion of the breath. Its mode of flight, when executing these circular manœuvres, must be somewhat abnormal, for any thing less like those of a Woodpecker than its actions when ordinarily on the wing cannot be imagined!

Nidification.—Mr. Bourdillon has lately had the good fortune to discover this interesting bird breeding in Travancore. Mention is made of this occurrence by him in his interesting paper on the birds of the Travancore Hills; and I am indebted to Mr. Hume for the following account written to him by Mr. Bourdillon for publication in the revised edition of 'Nests and Eggs of Indian Birds':—

"On March 17th I was attracted by hearing the chattering of a pair of these Rollers. On going to the spot I found them engaged in ejecting from a hole in a Vedu-plâ stump (*Cullenia excelsa*), about 40 feet from the ground, a pair of our Hill-Mynahs (*Eulabes religiosa*). One of the Rollers was in the mouth of the hole, and enlarging it by tearing away with its beak the soft rotten wood. The other Roller, seated on a tree close by, was doing most of the chattering, making an occasional swoop at the Mynahs whenever they ventured too close. I watched the birds for some time, until the Mynahs went off and there and then began building in a 'Pinney'-tree (*Calophyllum elatum*) within the distance of 100 yards. Ten days after I sent for some hill-men ('Khanirs,' we call them here), who managed to ascend by tying-up sticks with strips of cane, in the way that they erect ladders to obtain the wild honey from the tallest trees in the forest. It was past six o'clock in the evening before the Khanir reached the hole in which the birds had bred. He found not the slightest vestige of a nest, but a few chips of rotten wood, upon which were laid the three eggs. These I found to be slightly set. While the man was climbing the tree, the birds behaved in a very ridiculous and excited manner. Seated side by side on a bough, they alternately jerked head and tail, keeping up an incessant noisy chatter, and as the crisis approached, and the man drew nearer their property, they dashed repeatedly at his head.

"After the eggs were taken, the birds disappeared for about a fortnight, but returned, and, I believe, laid again in the same position. I did not molest them this time, wishing to get the young. Unfortunately I had to leave home, and on my return I found the birds, old and young, had disappeared."

Mr. Hume writes:—"Eggs of this species, sent me from Mynall by Mr. Bourdillon, closely resemble those of the Indian Roller, but are somewhat larger, though not quite so large as those of the European Roller. They are very broad ovals, pure white, and faintly glossy.

"The specimens I have vary in length from 1·34 to 1·42 inch, and in width from 1·14 to 1·16."

Fam. ALCEDINIDÆ.

Bill long, straight, conical, and very acute at the tip; gape wide and smooth. Wings with 10 primaries. Tail short. Legs and feet small; the toes syndactyle, the inner one sometimes wanting; soles broad and flat. Sternum with two emarginations on the posterior edge. Head large. Tongue diminutive.

PICARIÆ.

ALCEDINIDÆ.

Subfam. ALCEDININÆ.

Bill long, compressed, with the culmen keeled and the gonys straight. Wings reaching, when closed, beyond the middle of the tail; the 1st quill longer than the 5th. Tail moderate or short. Legs and feet small. Tarsus hardly longer than the inner toe; outer toe nearly as long as the middle, and united to it as far as the last joint; inner toe united to middle as far as the first joint.

Genus CERYLE.

Bill typically long, very straight, the culmen scarcely bent towards the tip, flattened above, with a well-pronounced groove adjacent to it; gonys very long and straight; gape angulated. Nostrils linear and oblique. Wings moderate; the 2nd and 3rd quills subequal and longest, and the 4th considerably longer than the 1st. Tail moderately long, about equal to the bill from tip to the gape, even at the tip. Tibia bare above the knee. Tarsus smooth, very short, much less than the middle toe; feet with a broad sole. Outer toe nearly as long as the middle, and joined to it as far as the last joint; inner toe much shorter, and joined to the middle as far as the 1st joint; hind toe very short.

CERYLE RUDIS.

(THE PIED KINGFISHER.)

Alcedo rudis, Linn. Syst. Nat. i. p. 181 (1766); Sykes, P. Z. S. 1832, p. 84; Gould, B. of Eur. pl. 62 (1837).

Ceryle rudis, Boie, Isis, 1828, p. 316; Blyth, Cat. B. Mus. A. S. B. p. 49 (1849); Kelaart, Prodromus, Cat. p. 119 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 172; Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 131 (1854); Jerdon, B. of Ind. i. p. 232 (1862); Layard, B. of S. Africa, p. 67 (1867); Tristram, Ibis, 1866, p. 84; Sharpe, Monog. Alced. pl. 19 (1868–71); Holdsworth, P. Z. S. 1872, p. 424; Shelley, B. of Egypt, p. 167 (1872); Hume, Nests and Eggs, p. 109 (1873); Legge, Ibis, 1874, p. 14, et 1875, p. 282; Hume, Str. Feath. 1875, p. 52.

Ispida rudis, Jerd. Madr. Journ. 1840, p. 232.

Ceryle varia, Strickl. Ann. & Mag. Nat. Hist. 1837, vi. p. 418.

Ispida bitorquata, Swains. Classif. B. p. 336 (1827).

Ceryle leucomelanura, Reichenbach, Handb. Alced. p. 21, pl. 309. fig. 3488 (1851).

The Black-and-white Kingfisher, Edwards, pl. 9; Kelaart, Prodromus. *Martin Pêcheur noir et blanc de Sénégal*, Buffon, Pl. Enl. 62.

Korayala kilkila, lit. "Spotted Kingfisher," Hind.; *Phutka match-ranga* and *Karikata*, Beng. (Jerdon); *To-he-haw*, lit. "Fishing Tiger" (Swinhoe).
Pelihuduwa, Waturanuwa, Gomera pelihuduwa, Sinhalese.

Adult male and female. Length 11·5 to 11·75 inches; wing 5·3 to 5·6; tail 3·0; tarsus 0·4 to 0·45; middle toe 0·6, its claw (straight) 0·35; hind toe 0·25; bill to gape 2·8 to 3·0, at front 0·23. Females average slightly larger than males.

Iris brown; bill black, the tip somewhat pale; legs and feet blackish, soles paler.

Adult male. Head, nape, terminal portions of the back, rump, and wing-covert feathers, primaries, and secondaries, central portion of tail, cheeks, a broad band across the chest (sometimes complete, at others interrupted in the centre), and another narrower one across the breast black: a broad patch above the lores continued as a supercilium to the nape, basal half and tip of tail, basal portion of the primaries and secondaries, the inner webs and tips of the latter, lateral margins of the crown and nape-feathers, the tips of the back, scapular, and wing-covert feathers, the major portion of the median wing-coverts, and the entire under surface with the under tail- and under wing-coverts pure white; edge of 1st primary likewise white; the lower plumage with a silky texture; the forehead more or less uniform black; a few fine black streaks on the white of the lower part of cheeks; a patch of feathers at each side of the belly, with large black subterminal markings.

Female. Differs from the male in wanting the lower or breast-band of black, and in having the upper broad chest-band interrupted in the centre.

The extent of the white edgings on the upper surface is variable in both sexes, and the older the bird the greater the gap in the breast-band of the female.

Young. Iris pale brown; bill reddish black, with a considerable portion of the tips yellowish white; legs and feet brown.

Very similar to adults, but with more white perhaps about the back of the neck; the feathers of the back more deeply tipped, and the wing-coverts and outer webs of the secondaries more marked with white. In the female, the chest-band is rather narrow and *complete*, dividing in the centre more and more as the bird grows older; in the male it is very broad, and likewise uninterrupted in the centre; more of the feathers of the lower flanks are spotted with black than in the adult. As considerable confusion has existed concerning the pectoral bands in the two sexes, I have noted the above peculiarities from a male and female nestling, able to fly, taken from the same nest.

Obs. Mr. Hume observes that in India females are larger than males; Ceylonese examples correspond in size with those from the mainland. Four females in the national collection measure as follows:—(1) wing 5·6, bill to gape 3·0 (Assam); (2) wing 5·4, bill to gape 2·8 (Kamptee); (3) wing 5·6, bill to gape 2·85; (4) wing 5·5, bill to gape 2·55. Four males:—(1) wing 5·2, bill to gape 2·7; (2) wing 5·4, bill to gape 2·95; (3) wing 5·5, bill to gape 2·85; (4) wing 5·45, bill to gape 2·85. The fourth female example is exceptionally short in the bill. The white of the primaries appears, as a rule, to approach nearer the tips of the feathers than in Ceylonese specimens that I have examined; in one Indian example it is 1·3 from the tip of the first quill, while in Ceylonese it varies from 2·0 to 1·5 inch from it. I also observe that the heads of the specimens above enumerated are more conspicuously striated with white; but this, as I have remarked with regard to Ceylonese examples, is variable. Reichenbach separated the Ceylon *Ceryle* as *C. leucomelanura*, on account of what he stated to be a large roundish spot under the shoulder, and of the band on the outer tail-feathers being divided into two parts: the first characteristic is nothing more than the incomplete breast-band in the *female*; and with regard to the second feature, this band will be found to be more or less divided in specimens from all districts; in scarcely any two examples are these feathers the same. A Mesopotamian female example measures 5·7 in the wing, another from Knysna, South Africa, the same, and one from Egypt 5·65. Western-Assam and African birds would seem, therefore, to be larger than Ceylonese.

Distribution.—The Black-and-White Kingfisher is more or less common throughout the whole sea-board, and in the northern half of the island its range extends inland to the great tanks, such as Kanthelai, Minery, Topare, &c., where it is tolerably frequent. In the Western Province it is found on the Kaluganga, and on the Bolgodde and Pantura lakes, the Negombo and Puttalam Canal, and other waters which are surrounded with open land. It is likewise common on the Gindurah and other large rivers in the south, keeping chiefly to those parts which flow through cultivated districts. On all the leways and salt lakes of the south-east and

round the whole of the east and north coasts it is common; on the Batticaloa lakes it is especially numerous. I have not observed it on any waters near the base of the hill-zone, nor have I any testimony of its having ever been procured in Dumbara or in other valleys in the upland.

This is the most widely-distributed of any Kingfisher, being found throughout the greater part of the continents of Asia and Africa. Commencing with India, we find it recorded by all observers as common in all open and well-watered districts, be they inland or skirting the shores of the peninsula. It is plentiful in the south, in the Deccan, in Chota Nagpur, and lower Bengal, but locally rare about the Sambhur Lake and in Rajpootana, though very abundant further east in Sindh; it extends to the base of the Himalayas, but does not ascend above the low country, as is the case in South India. Eastward of India it is found throughout Burmah and Tenasserim, extending thence into Siam and northwards into China, in some parts of which it is plentiful and in others rare. Of the latter localities Mr. Swinhoe cites Ningpo as one; on the Yangtsze, according to him, it does not occur below Szechuen, and this river seems to be its northernmost limit in China. Capt. Blakiston, however, records it from Hakodadi in Northern Japan. Turning westwards from India, we find Canon Tristram speaking of it as the commonest and most conspicuous Kingfisher in Palestine, being particularly abundant about Tyre and Sidon, along the shore to Mount Carmel, on the Jordan, and on the lake of Gennesaret. In Asia Minor, Mr. Durnford observed it at the waterfalls of the Cydnus.

On the sister continent of Africa it is equally well distributed: Captain Shelley and Mr. E. C. Taylor have it as common in Nubia and Egypt; but Mr. Drake does not seem to have observed it in Morocco. On the Gold Coast, again, Captain Shelley with Mr. Buckley met with it, and Governor Ussher writes of it as very common in Fantee generally, and it literally swarms on the river Volta. Messrs. Layard, Shelley, and Buckley all record it from South Africa—the latter gentleman mentioning it as pretty common in Natal, but much more so in the north of the Transvaal.

As regards Europe, Degland recorded it from Spain; but Mr. Saunders says that he has no authentic information of its occurrence there. Malherbe records it from Sicily. Lindermayer, as quoted by Mr. Sharpe, observes, in his 'Birds of Greece,' that it is found on the islands of Thermia and Mykone, and that Erhardt includes it as a summer visitant to the Cyclades. Demidoff says that it is confined, as regards the Black Sea, to the Sea of Marmora, not being found on the northern coast of the Euxine.

Habits.—This interesting Kingfisher is not particular in its choice of position, provided a plentiful supply of fish exists to tempt its clever fishing-powers; it certainly avoids rivers and water in forest-country, but otherwise it is equally at home on freshwater tanks or lakes, the half-dried leway, the broad and brackish estuary, the meadow-lined river or winding canal, the salt lagoon or land-locked bay, or even, in some parts of the world, the foaming shore. Although found in all such situations in Ceylon, it is, I think, most partial to brackish lagoons or backwaters, whereon it is a most persevering fisher, perching on stakes driven in to assist in laying nets or to mark the road across the shallows, or seating itself on some outstanding rock; thus it is to be seen flying about in the blazing noonday heat when scarcely another bird is abroad, and patiently hovering with downward-pointed bill about 30 feet in the air over some "fishy" spot, until with a sudden plunge it captures its well-earned prey and makes off to its favourite perch. It is generally in pairs and is most wary and watchful in its nature, starting off long before it is observed, and flying straight away to a place of safety; but when not alarmed it is constantly on the wing, flying up and down in a restless manner, and uttering its querulous quick-repeated note generally while on the wing. In addition to being so shy, it is a bird which is exceedingly tenacious of life, flying away more or less no matter how hard it is hit, and even when picked up exhausted from its wounds is hard to deprive of life. It darts invariably on its food from the wing, and descends perpendicularly and not in a slanting direction like other Kingfishers. Governor Ussher has seen them "hawking over the surf, and picking up waifs and strays brought in by the rollers, or now and then pouncing on an unwary fish." On the shores of the Holy Land, to which these birds resort in immense numbers in winter, Canon Tristram observed them "hovering by dozens over the sea about a hundred yards from the land, and occasionally perching with loud cries on an outlying rock. . . . . . During the most stormy gales of winter they continue, regardless of the weather, to hover over the breakers, ever and anon dashing down into the surf, and apparently diving to the bottom for their prey." I have observed them hover three

successive times without flying back to their perch; but they usually settle down again after making a plunge, from which they do not often return empty-mouthed.

Nidification.—Throughout the northern countries included in its geographical range this Kingfisher breeds in March, April, and May. In the former month I found it nesting in Ceylon in the earthy or alluvial banks of the Gindurah: the nest was situated about 3 feet from the entrance of the hole, which was about 4 inches in diameter; the eggs were deposited in a cavity of some 7 or 8 inches in diameter. As a rule grass is found on the floor of the chamber; and Canon Tristram speaks of finding an "abundantly heaped nest of grass and weeds" in all that he dug out in Palestine; bones, however, do not seem to be used, although by the time the young leave the nest it is a mass of such, the refuse of the large supply of food brought for their sustenance. Captain Marshall, as quoted by Mr. Hume (*loc. cit.*), notices a singular feature in this bird's economy, viz. that it is sometimes a gregarious breeder; he speaks of finding a hole leading to a sort of cavern about 3 feet across which was plentifully strewn with grass and rubbish and contained eggs in different corners. The number of eggs is usually four, but sometimes six; they are, of course, white and glossy, sometimes nearly spheroid and at others pointed at one end; they average, says Mr. Hume, 1·15 by 0·92 inch.

Mr. Blewitt witnessed these birds constructing the hole leading to their nest, and writes as follows:—"They alternately relieved each other at the work, and when tired sat together some short distance off for a few minutes." When the young first leave the nest they sit together on the bank near at hand, while the old birds bring them food; this I have observed in the meadows bordering the Gindurah river.

In South Africa, where the seasons are opposite to ours, it breeds at the end of the year. Layard found its nest in November, and says that it was composed entirely of fish-bones and scales.

Genus ALCEDO.

Bill not so straight as in the last, the culmen perceptibly curved from the base, not flattened above, compressed throughout; the groove slightly developed. Nostrils oblique and nearer the commissure than in *Ceryle*. Wings moderately rounded; the 2nd and 3rd quills subequal and longest; the 4th shorter and slightly exceeding the 1st. Tail very short and rounded at the tip. Legs and feet as in *Ceryle*, the hind toe longer in proportion to the inner.

ALCEDO BENGALENSIS.

(LITTLE INDIAN KINGFISHER.)

Alcedo bengalensis, Gm. Syst. Nat. i. p. 450 (1788); Kittl. Kupf. Vög. pl. 29 (1832); Sykes, P. Z. S. 1832, p. 84; Jerd. Madr. Journ. 1840, p. 231; Blyth, Cat. B. Mus. A. S. B. p. 49 (1849); Kelaart, Prodromus, Cat. p. 119 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 172; Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 129 (1854); Temm. & Schl. Faun. Jap. Av. pl. 38 (1850); Jerdon, B. of Ind. i. p. 230 (1862); Sharpe, Mon. Alced. pl. 2, p. 11 (1868–71); Holdsworth, P. Z. S. 1872, p. 424; Hume, Nests and Eggs, p. 107 (1873); id. Str. Feath. 1873, p. 168, et 1875, p. 173; Ball, ibid. p. 387; Legge, Ibis, 1874, p. 14; Oates, Str. Feath. 1875, p. 52; Butler, ibid. p. 456; Armstrong, ibid. 1876, p. 307; Inglis, ibid. 1877, p. 19.

Alcedo minor, Schl. Mus. P.-B. *Alced.* p. 7 (1863).

Alcedo japonica, Bonap. Consp. Vol. Anis. p. 10 (1854).

The Little Blue Kingfisher of some; *The Common Indian Kingfisher*, Jerdon; "*King of the Shrimps*," China (Swinhoe).

Chota kilkila, Hind.; *Chota match-ranga*, Beng.; *Nila buché gadu*, Telugu; *Ung-chim-pho*, Lepch.; *Gărūn*, natives in Himalayas; *To he-âng*, lit. "Fishing Reverence," or "the old gentleman that fishes!" Chinese of Amoy (Swinhoe).

Mal-pelihuduwa, lit. "Flower-Kingfisher," from its bright colours; also *Diya pelihuduwa*, Sinhalese.

Adult male and female. Length 6·0 to 6·3 inches; wing 2·7 to 2·82; tail 1·2 to 1·4; tarsus 0·3 to 0·4; middle toe and claw 0·67; bill to gape 1·72 to 1·95, average length 1·8.

Iris deep brown; bill, upper mandible blackish brown, lower yellow or reddish yellow; legs and feet coral-red, claws dusky.

Some male specimens which I have shot, and which seem fully adult, have the under mandible black, from which it appears that the coloration of this is uncertain. Mr. Armstrong notes it in some Irrawaddy examples as brownish white.

Basal portion of feathers of the head, hind neck, and a broad stripe leading from the lower mandible down the sides of the neck blackish brown; the terminal parts of these feathers, together with the tips of the wing-coverts, French blue; scapulars, ground-colour of the wing-coverts, outer webs of the quills, and the tail-feathers duller blue; back, rump, and upper tail-coverts bright cerulean blue (this colour becomes a shining green if held away from the light); inner webs of the primaries and secondaries, and terminal portions of the latter, dark hair-brown; lateral feathers of the rump and upper tail-coverts cobalt-blue.

Lower part of loral region black; upper part of the same, a broad streak passing over the ears, chest, and under surface, with the under tail- and under wing-coverts orange-rufous; chin, throat, and a continuation of the ear-stripe white, the latter separated from the throat by the blue cheek- and side-neck stripe; bases of the under-surface feathers white, imparting a non-uniform appearance to the plumage.

Young. Bill in some examples (males) with the under mandible black, like the upper, and tipped with whitish; in a female example which, from the green hue of the blue parts and the state of the organs, appears to be immature it is yellowish.

The distribution of the colours in the nestling is the same as in the adult, but the blue tints are greener than when older. This greenish blue is an individual peculiarity, as some immature examples are quite as blue as old birds.

Obs. This species is a small race of *A. ispida*, the European Kingfisher, differing from it in its proportionally longer bill and much less bulky body, although it measures very nearly as much as the latter in the wing. Ceylonese and

Indian specimens of *A. bengalensis* correspond very fairly in size, the balance perhaps being in favour of the latter. The measurements of several from different parts of India, which I have examined in the British Museum, are as follows:—(1) wing 2·95 inches, bill to gape 1·72; (2) wing 2·9, bill to gape 1·82; (3) wing 2·8, bill to gape 1·85 (Assam); (4) wing 2·85 (Kamptee). The dimensions of four specimens from the Irrawaddy delta, recorded in 'Stray Feathers,' are:—wing 2·75 to 2·8 inches, bill to gape 1·8 to 2·0, the latter measurement exceeding any that I have note of from Ceylon. Mr. Sharpe, in his exhaustive article in the 'Monograph of the Alcedinidæ,' gives the wing of Central-Asian and Philippine birds as 2·9 inches; and one I have examined from Celebes measures 2·7, bill to gape 1·97, and very stout. Compared with the above dimensions, Mr. Sharpe notes the average size of the wing in *A. ispida* as from 2·95 to 3·1. An example from Belgium, examined by myself in the national collection, has the wing 2·95, and the bill to gape 1·6; another from England, wing 3·05, and bill to gape 1·95. A Cairo specimen of *A. bengalensis* has the wing 2·8, bill to gape 2·0, and is referred to this species by Mr. Sharpe purely on account of its length of bill. In fact the two species grade into one another at the north-west confines of India and throughout the west of Asia to the borders of Europe in such a manner that it would be difficult, from a mere perusal of dimensions, to arrive at a proper identification; typical specimens of the Indian form are found far to the west and out of its usual habitat, but no typical examples of the European form are found further within the habitat of *A. bengalensis* than Sindh. In this latter region Mr. Hume considers the race to be an intermediate one, which averages as large as *A. ispida*, while the bills are, as a rule, shorter than in either species. He also notes that the birds from the Andamans and Pegu have very short bills.

Distribution.—The present species inhabits the whole island of Ceylon, from the sea-coast to the level of the Nuwara-Elliya plain. Wherever there is water, be it the tiny pond resorted to by buffaloes and wild animals in the midst of a parched-up district, or the flooded paddy-field, the lonely tank or forest river, the brackish lagoon, or even the rocky sea-shore, the Little Kingfisher is sure to be found. In the wet districts of the west and south its numbers are greater than in the north and east, but nevertheless in these it congregates in great numbers in those few spots where water is to be found.

Every forest-lined river has its pair of Kingfishers at every quarter of a mile, which dwell in the out-spreading branches of the Koombook and Mee-trees, and ever and anon plunge into the trickling stream beneath them. It is common enough in the Central-Province valleys drained by the Mahawelliganga and its affluents, but above 3500 feet becomes tolerably scarce. It finds its way to the Nuwara-Elliya lake up the streams from the Fort-Macdonald patnas; but I have not seen it on the streams between there and the Horton Plains, nor on the source of the Maha Elliya in the plain itself, the rise through forest from Galagama of the latter stream to the level of the plain (about 5600 feet) being too great for the explorations of the Little "Fisher."

This bird is found all over India, being in nearly all parts the most numerous of its family in the peninsula. It is not frequent in some of the hill-districts of the south, for I observe that neither Mr. Bourdillon nor Mr. Fairbank met with it on the Travancore and Palani hills. It is, however, not uncommon in the Nilghiris, and has been found nesting as high as Ootacamund. It is noted as being very common in the Kandhala district and also in Chota Nagpur. Turning to the north-west we find it rare at the Sambhur Lake, common at Mount Aboo and in the Guzerat plains, and very rare again in Sindh, where it is replaced by a larger race as above noticed. It extends north of India into Central Asia and the Amoorland, where Schrenk procured it; and to the westward Mr. Sharpe notes it from Cairo, the Sinaitic peninsula, and Nubia. Canon Tristram, however, only met with *A. ispida* in Palestine. To the east and south-east of India it has an extensive range, being found in Burmah, Tenasserim, Malacca, the Andamans and Nicobars, Java, Sumatra, Labuan, Borneo, and Celebes, extending northwards again to Formosa, the Loochoo Islands, Eastern China, and Japan. Swinhoe received it from Hakodadi, Northern Japan, which is its most northerly observed limit on the eastern bounds of Asia. The only locality in Sumatra from where I can find it recorded is Lampong, on the south-east coast; but when this vast island has been more explored it will doubtless be found in its western portions.

Habits.—This tame and watchful little bird passes the entire day in the constant search for its prey; no bird in Ceylon is more diligent in seeking for the means of existence than this pretty little Kingfisher, which takes up its post on any object over water, and while calling to its mate, who is generally close at hand, executes its curious little gesture of frequently jerking up its head with a combined similar movement of its

tail, and darts with an unerring aim on the tiny inhabitants of the pool. It is bold and regardless of man to a degree, not hesitating to seize a fish close to a bystander; and, indeed, I have more than once seen it take up its quarters over my head while camped on the sandy bed of a forest river, and dash over and over again into the water at my feet. It is possessed of the keenest sight, pouncing often on its prey from a very considerable height above the water. It usually lives in pairs, which dwell together on terms of the greatest sociability; on one joining its companion the two become quite garrulous for some minutes, uttering in consort their clear piercing little whistle, accompanied by a vigorous bobbing up and down of heads and sundry spasmodic up-jerkings of their tails. The flight of this species is very swift; it flashes past like an arrow, its blue plumage gleaming against the sombre green of the forest, and its clear note often rousing the tired sportsman from his reverie. I have more than once observed it hovering for an instant close to the water, it having suddenly checked itself in its flight, perhaps to observe some fish too deep at the moment to pounce upon. Swinhoe notes the same habit, remarking that it is done close to the surface of the water and not high up after the manner of the last species. Concerning this little bird's temerity in seizing fish, there is an interesting note in 'Stray Feathers,' 1873, by Mr. H. J. Rainey, which shows likewise the occasional rapacity of the Brahminy Kite. This gentleman writes:—"I observed a Brahminy Kite make a rather leisurely swoop at a fish swimming on the surface of the stream; but when almost within its grasp a Kingfisher (*A. bengalensis*), which had darted down swiftly, carried off the prey. This appears to have infuriated the Kite, and it immediately followed in hot pursuit of the Kingfisher, and after a long and 'stern' chase, it eventually succeeded in seizing its unresisting quarry; holding the screeching bird securely in its talons it bore it to the shore, and after complacently plucking the feathers of its (then still living) victim it set about devouring its flesh with evident satisfaction. On my approaching the spot, soon after the Kite had commenced its savage repast, it flew away, leaving little else than a few bare bones of the Kingfisher" (and, as *I* should have added, me vowing vengeance against the whole race of Brahminies). Layard speaks of this little Kingfisher being caught in Ceylon by Moormen, who export the skins to China, where they are used for embellishing fans. This trade does not seem to be carried on now.

Nidification.—In South, West, and Central Ceylon the breeding-season of this species is from February until June; but in the north I have known it to nest in November. It excavates a hole about 2 feet 6 inches or 3 feet deep in the soft or upper earth of a stream or river-bank, or, in fact, in any situation where such soil exists, for I have found its nest in the sides of the cavities excavated by coolies in making roads and far away from any water. At the end of the hole the little miners scoop a cavity about 6 inches in diameter and deposit frequently a layer of small fish-bones on the earth, on which the eggs are laid. In this its habits are one with those of its European representative. The eggs are said in India to be usually five to seven in number; three are, however, sometimes laid, as Dr. Holden writes me of finding a nest with three young in Hewahette. They are very round and glossy, and pinky white when unblown, averaging 0·8 by 0·68 inch. One specimen brought to me as the egg of this species, from Baddegama, measured 0·81 by 0·76 inch.

PICARIÆ.

ALCEDINIDÆ.

Subfam. HALCYONINÆ.

Bill shorter, much broader at the base, and less compressed than in the last subfamily; lower mandible very deep at the gonys-angle, with the gonys ascending in a curve to the tip. Wings more rounded, the 1st quill shorter, and the tips of the primaries not reaching, when closed, to half the length of the tail.

Mostly of large size, and, to a great extent, reptile feeders.

Genus PELARGOPSIS.

Bill very large, stout, the culmen flat and perfectly straight to the tip; groove pronounced and parallel to the ridge. Nostrils slightly advanced, gape angulated; gonys deep and ascending in a curve to the tip. Wings with the 3rd quill the longest, and the 1st much shorter than the 5th. Tail rather long and even; tibia bare in front above the knee; tarsus stout; toes scutellate, the outer and middle subequal, but the middle claw much longer than the outer; claws deep and expanded at the sides.

Of large size.

PELARGOPSIS GURIAL.

(THE INDIAN STORK-BILLED KINGFISHER.)

Halcyon gurial, Pearson, J. A. S. B. 1841, x. p. 633; Blyth, Cat. B. Mus. A. S. B. p. 47. no. 200 (1849), et Ibis, 1865, p. 30.

Halcyon capensis, Jerd. Madr. Journ. 1840, Cat. no. 245, p. 231; Kelaart, Prodromus, Cat. p. 118 (1851); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 177; Legge, Ibis, 1874, p. 14.

Halcyon brunniceps, Jerdon, 2nd Suppl. Cat. Madr. Journ. 1844, p. 143.

Halcyon leucocephalus, Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 123 (1854); Jerdon, Birds of Ind. i. p. 222.

Pelargopsis gurial, Cab. & Heine, Mus. Hein. ii. p. 156 (1860); Sharpe, P. Z. S. 1870, p. 66; id. Mon. Alced. pl. 34 (1868–71); Holdsworth, P. Z. S. 1872, p. 423; Legge, Ibis, 1875, p. 275; Hume, Nests and Eggs, p. 105 (1873); Ball, Str. Feath. 1874, p. 386.

The Gurial Kingfisher, Latham, Hist. iv. p. 12; *The Cape Kingfisher*, Kelaart; *Brown-headed Kingfisher*, Jerdon; *Gurial*, Beng.; *Alcyone*, Portuguese in Ceylon.

Maha pelihuduwa, lit. "Great Kingfisher," also *Waturanuwa*, Sinhalese.

Adult male. Length 14·75 to 15·3 inches; wing 5·75 to 5·9; tail 3·75 to 4·0; tarsus 0·7; middle toe 1·0, its claw (straight) 0·42; outer toe 1·0, its claw (straight) 0·3; bill to gape 3·6 to 3·75, depth at gonys-angle 0·8.

Female. Length 15·0 to 15·3 inches: wing 6·0 to 6·3; tail 4·0 to 4·4; tarsus 0·8; bill to gape 3·8.

Iris brown, chestnut-brown in some: eyelid dull red; bill arterial blood-red, dusky at tips of both mandibles; inside of mouth coral-red; legs and feet coral-red, claws dusky.

Head and hind neck, including the face and ear-coverts, dull brown, tinged with greenish on the crown and hind neck, which is most perceptible when the feathers are new; forehead and lores slightly paler; interscapular region and scapulars dingy bluish green; lesser secondary wing-coverts almost concolorous with the scapulars, while the greater wing-coverts, outer webs and tips of secondaries, and tertials are dull greenish blue; primaries and inner webs of secondaries dark glossy brown, the basal portions of the outer webs of the primaries concolorous with the blue of the secondaries, and the terminal portions faintly tinged with blue; back and rump brilliant pale azure-blue, with a silky lustre; upper tail-coverts bluish green; tail greenish blue, with the inner webs changing into French blue; shafts deep black.

Entire under surface, sides of neck, and a broad nuchal collar just below the lower cap orange-buff, paling to albescent buff on the gorge and chin, and deepest on the flanks and under wing-coverts; under surface, quills, and tail pale brown.

Females have the head scarcely tinged with greenish, and the brown in old feathers paler than in new.

Young. Bill darker at the tips than in the adult: eyelid yellowish red; legs dusky red. *Birds of the year* have the chin almost quite white, the buff of the under surface overcast with a brownish hue, particularly on the chest, and the feathers of the fore neck, chest, nuchal collar, breast, and flanks with crescentic margins of brown, coalescing on the sides of the chest, just beneath the point of the wing when closed, into a narrow band, which joins the green of the interscapular region; lores and forehead darker than in the adult; least wing-coverts faintly edged with fulvous; ground-colour of the scapulars darker than in the adult.

With age the dark pencillings on the under surface disappear from the chest and remain only on the sides of the breast, from which they do not vanish until the bird is fully aged.

Obs. The Ceylon race of this Kingfisher appears to be, as a rule, more tinged with green on the "cap" than Indian birds, and resembles, in this respect, *Pelargopsis malaccensis*, Sharpe, differing from this, in the adult stage, in the less dark mantle, although I must say young birds are very like the latter species: this is, however, a smaller bird, the wings of two specimens measuring 5·55 and 5·65 inches. Indian examples of *P. gurial* from Madras measure 5·7 to 5·95 inches in the wing, and 3·7 to 3·9 in the bill from the gape. Mr. Ball gives the following dimensions, *loc. cit.*:—(Rahmehal) wing 6·15 inches, bill from gape 3·6; (Calcutta) wing 5·95, bill from gape 3·7; (Satpuras). ♂, wing 6·1, bill from gape 3·55. The Indian and Ceylonese bird comes very near to *P. fraseri* from Java and *P. burmanica* from Burmah, two other closely allied species: the former has the back and wings of that peculiar blue tint considered to be characteristic of *P. malaccensis*, and the brown cap is sometimes absent. The wing of an example which I have examined is 6·1, bill to gape 3·5; the latter has the cap very pale and the back greyer than in *P. gurial*, being simply a pale form of this bird. All these species are so nearly allied that they appear to me to be merely races of *P. gurial*; and I observe Mr. Hume remarks to the same effect, 'Stray Feathers,' 1877, p. 19. Mr. Holdsworth was the first to rectify the synonymy of this species as a Ceylonese bird, Kelaart and Layard having followed Jerdon's name of *capensis*, bestowed on it in the Madras Journal, 1840.

Distribution.—This large and noisy Kingfisher is found more or less on all the rivers and wild streams throughout the island, frequenting likewise the brackish lagoons and backwaters round the eastern and northern coasts, and the large sea-board lakes of the Western Province; in the latter district it is found in large jungle-begirt paddy-fields, and on the Gindurah, Kaluganga, Kelaniganga, and Maha-oya rivers. It is also an inhabitant of the Ikkade-Barawe forest and other large jungles not far from Colombo which are traversed by streams. It is pretty generally diffused through the hill-country near Galle, in which there are numerous isolated paddy-fields lying between hills, and generally drained by a stream fairly stocked with fish. The lonely tanks, particularly the smaller sheets of water surrounded by large trees which are scattered throughout the northern half of the island, and the romantic rivers which flow both east and west through that region from the hill-zone, are its favourite abode; along the whole course of the Mahawelliganga from Kottiar to the base of the hills it is common, and, I believe, ascends this river into Dumbara, though it is not of very frequent occurrence in that valley.

Jerdon remarks of this Kingfisher that it is found over all India, from the extreme south to Bengal, chiefly where there is much jungle or forest or where the banks of rivers are well wooded—precisely the same conditions which regulate its habitat in Ceylon. Mr. Fairbank saw it at the base of the Palani hills,

and once near Mahabaleshwar, and Jerdon remarks that it is rarely seen in the Carnatic or the tableland. It is common in Bengal, but has been met but rarely in the north-west. At the Sambhur Lake and in Sindh it does not appear to be found. In the contrary direction, in Chota Nagpur, Mr. Ball says it is met with occasionally, as also on the Rajmehal and Satpura hills. It is not uncommon about Calcutta, and Dr. Hamilton observed that it bred in mud walls in that neighbourhood; it extends to the lower Himalayas. In Burmah it is replaced by the paler race *P. burmanica,* and even in Cachar Mr. Hume says the Stork-billed Kingfisher belongs more to the latter than to the present species.

Habits.—The Stork-billed Kingfisher always frequents the vicinity of water, and, as far as my experience goes, feeds entirely on fish and frogs. It is solitary in habit and rather sluggish, taking up its post on the branches of forest-trees overhanging water, or in the mangroves lining brackish lagoons, and at long intervals plunges headlong down on its prey, splashing up the water in its descent. Every now and then it gives out its loud discordant cries, and generally moves on to some other likely spot with a straight-on-end and powerful flight. It is very early astir in the morning, awakening with its far-sounding laugh the traveller who has halted for the night on the borders of the forest-lined river, or welcoming the sportsman on the termination of his long and early morning drive to some lonely Snipe-ground. I have seen it, when disturbed by gun-shots, take long flights across extensive paddy-fields, and after reaching a place of safety shout vociferously for a quarter of an hour. When wounded it is capable of inflicting a severe blow with its huge bill; and a Mr. Smith, in his MS. notes quoted by Dr. Horsfield, mentions an instance in which he "once observed a contest between one of these birds and a Hawk of considerable size, in which the Hawk was worsted and obliged to leave his hold, from the effects of a severe blow which the other administered to him on the breast." Mr. Ball remarks that he has only once seen it plunge into water for the purpose of capturing a fish. I have been more fortunate than this; for I have seen it several times in the act of seizing its prey; but it certainly is a far less active fisher than other members of its family that have come under my notice. Layard found this bird feeding on crabs and small Mollusca, as well as on fish.

Nidification.—Breeds in secluded spots, excavating a deep hole in the side of a river-bank or in the bund of a tank beneath shady trees. The nesting-time in Ceylon is during the first three or four months in the year. Mr. Edward Creasey, Ceylon Survey Dept., found a nest in the Jaffna district which was situated 7 feet from the entrance to the hole; it contained two eggs, which were spherical in shape, pure white, and measured 1·45 by 1·23 inch. Mr. Thompson found it breeding in May on the streams debouching from the Himalayas, and speaks of a nest containing five young ones, near which there were some deserted habitations, each having the appearance of having served its turn as a breeding-place in former years. Another writer, Mr. Theobald, notes its laying in the fourth week in June.

Genus HALCYON.

Bill differing from the last in having the culmen sharply keeled and curved slightly near the tip, and the upper mandible suddenly compressed. Nostrils more oblique, less advanced; gape less angulated. Wings with the 2nd quill subequal to the 3rd. Tibia feathered in front to the knee. Of smaller size than *Pelargopsis.*

HALCYON SMYRNENSIS.

(THE WHITE-BREASTED KINGFISHER.)

Alcedo smyrnensis, Linn. Syst. Nat. i. p. 181 (1766).

Halcyon smyrnensis, Steph. Gen. Zool. xiii. p. 99 (1826); Sykes, P. Z. S. 1852, p. 84; Blyth, Cat. B. Mus. A. S. B. p. 47 (1849); Kelaart, Prodromus, Cat. p. 118 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 172; Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 125 (1854); Tristram, Ibis, 1866, p. 86; Sharpe, Mon. Alced. pl. 59 (1868–71); Holdsworth, P. Z. S. 1872, p. 424; Hume, Nests and Eggs, p. 105 (1873); Adam, Str. Feath. 1873, p. 372; Hume, ibid. 1874, p. 167; Legge, Ibis, 1874, p. 14.

Alcedo fusca, Bodd. Tab. Pl. Enl. 54 (1783).

Halcyon fuscus (Bodd.), Jerdon, B. of Ind. i. p. 224; G. R. Gray, Gen. of Birds, i. p. 79 (1849).

The Smyrna Kingfisher, Latham; *The Indian Kingfisher*, Horsfield; *Blue Kingfisher*, Europeans in Ceylon.

Kikila, Hind.; *Sade-buk match ranga*, Beng.; *Lak muka*, Tel.; *Vichuli*, Tam. (Jerdon); *Matsya-ranga*, Sanscrit; *Fei-tsuy*, China (Swinh.).

Pelihuduwa, Sinhalese; *Kalavi kuruvi*, lit. "Wide-mouthed Bird," Ceylon Tamils (Layard).

Adult male and female. Length 10·8 to 11·1 inches; wing 4·4 to 4·6; tail 3·2 to 3·4; tarsus 0·5; middle toe 0·7 to 0·75, claw (straight) 0·37; bill to gape 2·5 to 2·7; depth at gonys-angle 4·9 to 5·7.

Iris sepia-brown; bill deep arterial red; inside of mouth vermilion; anterior portion of legs and feet dark brownish red; posterior portion and soles of feat orange-red; claws blackish.

Head, cheeks, back, and sides of neck, sides of chest, and all the lower parts from the breast downwards with the under wing-coverts deep chestnut-brown or reddish chocolate-colour, darkest on the head, hind neck, and sides of chest; back, scapulars, rump, upper tail-coverts, tail, secondaries, and basal portion of outer webs of all but the first primary, when viewed against the light, turquoise-blue, brightest on the back, rump, and secondaries, and when viewed with the light malachite-green; tertials and margins of the tail-feathers with a decided greenish hue; first primary, terminal portion of the rest, tips of secondaries, and inner half of the inner webs blackish brown; least wing-coverts lighter chestnut than the head, the median secondary coverts coal-black; shafts of tail-feathers black; a fine line just beneath the lower eyelid, chin, fore neck, centre of the chest, edge of the wing, and basal portion of the inner webs of the primaries white, increasing on the latter towards the inner feather, on which it approaches close to the tip.

Some examples have a brownish wash on the forehead and crown, and, in fact, the chestnut portions of the plumage are, as a rule, variable, some birds being darker in this respect than others. It is worthy of remark that if this Kingfisher be held away from the light, the *white chest assumes a greenish hue.*

Young. The nestling has the bill red at the base, paling to yellowish towards the tip, which is black.

The feathers of the head and hind neck are pale-tipped, mostly so on the forehead; the least wing-coverts are tinged with black.

Obs. Although the chestnut colour in this species is variable, I doubt not that, if a large series of Ceylonese examples were compared with a good many from most parts of India, they would be found to be, as a rule, darker than the latter; and I do not think they attain the same size as some Indian specimens. Mr. Hume gives the largest of forty birds as 4·85 in the wing, and remarks that his extreme southern specimens from Anjango are the darkest and smallest, and therefore correspond best with ours. The least wing-dimension in Anjango birds is 4·4. I have, however, a specimen from Ramisserum Island with the wing 4·5 inches, but with a very small bill, measuring 2·35 to gape and 0·48 in depth at gonys-angle. It likewise has the chest very strongly tinged with green. As regards the head and hind-neck hues, Ceylonese birds resemble those from the Andamans; but these latter, in addition to being darker than those from *any other part of Asia*, are larger, and have therefore been separated as *H. saturatior* by Mr. Hume. The greenish-blue tint on the white chest is observable in Nepal, Kamptee, and Beloochistan specimens, also in one from Jericho; but they must be held *from* the light, with the bill pointed towards the eye, in order to produce this colour to the greatest extent. The Jericho specimen is somewhat paler on the head than one from Colombo; but the under parts and sides of the chest are darker if any thing: it has the wing 5·1 inches; bill to gape 2·7. Another from Beloochistan is slightly greener in all lights than Ceylonese individuals, and has a white stripe above the lores; wing 4·95, bill to gape 2·7. An example from Bagdad is pale on the head and has a white superciliary line. For purposes of comparison, I will add that an Andaman example of *H. saturatior* measures 5·1 inches in the wing, but the bill to gape is only 2·75.

Distribution.—This handsome Kingfisher is extremely common in Ceylon, and is spread over the whole island, inhabiting the Kandyan Province up to the altitude of Nuwara Elliya, at which place it has made its appearance since the lake was found. It is more plentiful in the Western and Southern Provinces and in the cultivated portions of the northern district than in the jungle-covered country of the interior, for though it occurs on the forest-rivers it is not so abundant as the Stork-billed or little Blue Kingfishers. It is fairly numerous in the islands of the Jaffna district and in Manaar, and Mr. Holdsworth says it is not uncommon at Aripu. In the northern forests it is more often found near village tanks and on new clearings than elsewhere. In the Kandyan Province it is chiefly an inhabitant of the terraced paddy-fields, and is tolerably numerous in the well-cultivated valleys.

Out of Ceylon it has a very wide range, being found all over India, extending eastward to China and westward to Palestine and Asia Minor. As regards India it has been recorded as a common bird from all parts of the low-lying districts which have been worked out; but though Mr. Bourdillon found it plentiful at the foot of the Travancore hills, it did not ascend there to any height. Mr. Fairbank likewise only observed it in the lower Palanis.

From the low districts of Bengal, where it is very common, it extends to the base of the Himalayas, and westward through Sindh into Persia and Palestine, where Canon Tristram found it in the Jordan valley up to the sources of the river; beyond this Russel recorded it, in the last century, in his 'Natural History of Aleppo,' to be an inhabitant of Asia Minor. Captain Graves met with it in the same locality after the lapse of a century, during which time it had escaped the observation of naturalists. Canon Tristram and Mr. Sharpe note it as a doubtful straggler to Europe. From Burmah it extends into Tenasserim and the Malay peninsula. In many parts of China it is common, and resident, according to Mr. Swinhoe, from Canton to the river Yangtsze; he likewise procured it in Formosa.

Habits.—Although this Kingfisher frequents paddy-fields, streams, rivers, swamps, and fresh water in all situations, it is almost as often found affecting clearings in the jungle, dried-up fields, cultivated gardens, and the edges of open wastes, and in such places subsists on lizards, grasshoppers, crickets, locusts, and even small snakes. It invariably resorts to new clearings in the forest after they have been burnt off, and takes up its position on stumps or branches of charred trees, and therefrom flies down on the lizards and insects which it espies on the blackened soil. Mr. Inglis, in his 'List of Birds of Cachar,' mentions seeing one so occupied for half an hour, and on shooting it found its stomach crammed with crickets. Mr. Ball has seen it dive for fish on one occasion; but this must be an occurrence of extreme rarity; he writes that in Chota Nagpur it is snared, and the flattened-out skins disposed of to merchants, who sell them to Burmese traders for ornamenting court-dresses. In Ceylon it is best known to those who do not penetrate into the wilds as an inhabitant of the paddy-fields, of which it is one of the chief ornaments in the way of bird-life, and is the first bird which attracts the attention of the new arrival in the island as he trudges through his first hot December-day's Snipe-shooting.

It is, perhaps, the first bird astir at daybreak, and when there is scarcely enough light to discern it, flies up to the top of the highest tree near at hand and pipes out its plaintive trilling note for a considerable time, and then makes off to some favourite outlook, uttering its loud harsh call, very different from that which it has just indulged in. This latter is always uttered when the bird is on the wing, while the former is only heard when it is perched. When a lizard, which is a favourite meal, is captured, it is hammered against a stone or branch of a tree until dead, and then devoured whole, and crabs and mollusks are treated in the same way when the bird has taken up its quarters by a stream. I have observed one launch out from a high tree, in the manner described by Layard, on a butterfly; but this writer records an evil deed against the lovely bird, which is worthy only of such a cannibal as the *Kotoruwa* (*Megalæma zeylanica*). He relates that one which was "unluckily introduced into an aviary, destroyed most of the lesser captives ere he was detected as the culprit; he was at last caught in the act of seizing a small bird in his powerful bill; he beat it for a moment against his perch, and then swallowed it whole!" The habits of this species as observed in Palestine by Canon Tristram are somewhat different to those which obtain with it in India and Ceylon. He writes:—"It loves to sit moodily for hours on a slender bough overhanging a swamp or pool, where the foliage helps to conceal its brilliant plumage, and where, with cast-down eyes and bill leaning on its breast, it seems benumbed or sleepy, until the motions of some lizard or frog in the marsh beneath rouse it to a temporary activity. When disturbed, it rather slinks away under the cover of the overhanging oleanders than trusts for safety to direct flight." In one example he found a snake 18 inches long, entire. In the Holy Land it is solitary in habit as in Ceylon, where two birds are scarcely ever seen together.

Nidification.—In the west and south of Ceylon this species breeds from January till April, and in the north I have found its nest as late as July. It nests in a bank generally near water or in the bund of a tank, penetrating from 2 to 4 feet, and then excavating a large vault, sometimes 9 inches in width, in which it lays its eggs, which are usually four in number, though sometimes six. In a nest which I took in the breach in the great "bund" of Hurullé tank there were no bones, nor any thing used for a lining to the nest; the passage and egg-chamber, however, frequently contain remains of frogs, lizards, &c., which have been taken in by the old birds for feeding their young. The eggs are pure white, round in shape, and those that I have seen from Ceylon vary from 1·14 to 1·2 inch in length by 1·0 to 1·04 inch in breadth. In India this bird often nests in mud walls and sometimes in open wells, Mr. Hume recording an instance of one building in a hole in the side of a well 100 feet below the surface of the ground. The eggs, when first laid, have, it is said, a beautiful gloss; but they rapidly lose this, as those I have taken were rather dull than otherwise. Some attain a size of 1·27 by 1·12 inch, or as large (as Mr. Hume remarks) as a Roller's egg.

HALCYON PILEATA.

(THE BLACK-CAPPED PURPLE KINGFISHER.)

Alcedo pileata, Bodd. Tabl. Pl. Enl. 41 (1783).

Halcyon pileata, Gray & Mitchell, Gen. of Birds, i. p. 79 (1844); Sharpe, Mon. Alced. p. 169, pl. 62 (1868–70); Holdsworth, P. Z. S. 1872, p. 424; Hume, Str. Feath. 1875, p. 51; Armstrong, ibid. 1876, p. 306; Sharpe, Ibis, 1876, p. 33.

Alcedo atricapilla, Gm. Syst. Nat. i. p. 453 (1788).

Dacelo pileata, Schl. Mus. P.-B. *Alced.* p. 27 (1863); id. Vog. Ned. Ind. *Alced.* pp. 22, 54, pl. 9 (1864).

Halcyon atricapillus, Blyth, Cat. B. Mus. A. S. B. no. 204, p. 47 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 171; Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 124 (1854); Gould, B. of Asia, pt. xii. (1860); Jerdon, B. of Ind. i. p. 226 (1862); Hume, Str. Feath. 1874, p. 168.

Entomobia pileata, Salvad. Ucc. di Borneo, p. 102 (1874).

Martin Pêcheur de la Chine, Buff. Pl. Enl. 673 (1770); *The Black-capped Kingfisher*; *Black-winged Kingfisher.*

Udang, Malay; *Burong udang*, Sumatra (Raffles).

Adult male and female (Burmah). "Length 11·7 to 12·5 inches; wing 4·9 to 5·3, expanse 18·0 to 18·75; tail from vent 3·3 to 3·75; tarsus 0·6 to 0·7; bill to gape 2·9 to 3·15" (*Armstrong*).

Layard's Ceylonese specimen measures 5·4, a male shot by Mr. Oates 5·3, and two examples in my own collection 4·8 and 5·1 inches (the former is an immature bird).

Iris reddish brown, dark brown, or olive-brown; bill deep coral-red; legs and feet dull red, brownish on the front of tarsus; claws "horny brown."

Head, face, ear-coverts, nape, and wing-coverts coal-black; back, scapulars, upper surface of tail, primary-coverts, and the outer webs of the secondaries and tertials ultramarine-blue, very brilliant on the interscapular region, and changing into a lustrous smalt-blue on the upper tail-coverts; a broad band of white across the hind neck, immediately beneath which the blue of the back is shaded with black; terminal half of primaries and tips and inner webs of secondaries dull black, the basal half of the former delicate bluish, or bluish white on the outer webs and pure white on the inner.

Chin, fore neck, centre of chest, and upper breast white; sides of chest and fore neck, flanks, lower breast, abdomen, under tail-, and under wing-coverts fine tawny rufous, blending into the white of the fore neck, and often tinging the hind-neck collar; under surface of tail blackish.

Young. Birds of the year have the black of the upper parts and the blue of the back and rump less pure, and the sides of the chest and breast, as also the feathers of the hind-neck collar, marked with crescentic tippings of blackish brown; but in some examples the latter part is striated with brown instead of barred. These crescentic markings appear to remain until the bird is fully aged, as they are present in many specimens which have the upper surface in beautiful adult feather.

Distribution.—This lovely Kingfisher has been only once recorded from Ceylon. Layard speaks of one specimen having been shot in the island of Valenny, near Jaffna. This bird, which must have been a straggler driven to the coasts of Ceylon by the northerly winds of December, is now in the Poole collection and is in a fair state of preservation. Its occurrence in Ceylon is very interesting, as it is a rare bird in India, and particularly so in the south. Jerdon shot a specimen at Tellichery, on the Malabar coast, and saw others from the same locality; he speaks of it having been procured as high up the Ganges as Monghyr, although it is rare in Bengal. It affects wooded country near the sea, and consequently is more common in

the Sunderbunds than elsewhere in India. It has not, I believe, been found anywhere to the west of Lower Bengal. In Burmah it is common near the sea, though rare up at Thayetmyo. Mr. Armstrong writes:—"This beautiful Kingfisher formed a marked characteristic of the avifauna belonging to the Irrawaddy delta. It was to be seen everywhere. It was abundant among the mangroves on each side of every creek and nullah; the shore-jungle along the coast from Elephant Point to China-Ba-keer resounded with its discordant cry." It is found in Tenasserim and throughout the Malay peninsula, where it is far from uncommon, inhabiting likewise the islands in the Bay. In these, however, it is rare, both as regards the Nicobars and the Andamans. Mr. Davison saw it at Trinkut and Kondul in the former, and Mr. Hume has received it from Port Blair, Andamans. It is known from both Java and Sumatra, and Count Salvadori includes it in his 'Birds of Borneo,' where also Mr. Alfred Everett has of late years procured it. Further north it is an inhabitant of China, in which country, Mr. Swinhoe remarks, it is found from Canton to the Yangtsze, and is rare in the neighbourhood of Amoy. Dr. Zelebor, who accompanied the 'Novara' Expedition, found it at Hong Kong.

Habits.—This species loves thickly wooded estuaries and brackish creeks such as are found in the great Sunderbunds near Calcutta, in the delta of the Irrawaddy, and other similar localities, in the impenetrable jungle of which it passes a generally unmolested existence, feeding on the crabs which abound in the muddy creeks and nullahs. These crustaceans form its favourite food. Mr. Armstrong says that in the Irrawaddy delta "under every little projecting twig along the sea-shore a quantity of white excreta and the remains of the legs and bodies of small crabs showed where one of these birds had been making its dinner and indulging in its siesta. Each bird appears to have its own favourite watch-tower, and when disturbed flies away with a shrill cry, taking a semicircular stoop to some dry twig on ahead, and as soon as it thinks that the danger is passed by returns again to the post from which it has been dislodged." Captain Wimberley, who shot this bird at Port Blair, says it is excessively shy and wary, and that he had to go out day after day before he could procure it. It has a harsh crowing call according to Jerdon, and which is described by other writers as discordant. Dr. Zelebor likens it to the cry of the European Great Spotted Woodpecker.

The Chinese, with their usual admiration for the feathers of Kingfishers, put those of this species also to ornamental purposes, using them for the manufacture of their fans.

I am unable to give any information concerning the nesting of this species.

Genus CEYX.

Bill much as in *Halcyon*, the culmen less keeled. Wings with the 1st quill as long as in *Alcedo*, and the 4th not much shorter than the 3rd. Tail short and broad at the base, rounded at the tip. Tarsus much shorter than the anterior toes; *inner toe wanting*; claw of outer toe very short.

CEYX TRIDACTYLA.

(THE INDIAN THREE-TOED KINGFISHER.)

Alcedo tridactyla, Pall. Spic. Zool. vii. p. 10, pl. 11. fig. 1 (1769).

Ceyx tridactyla, Sykes, P. Z. S. 1832, p. 84; Jerdon, Ill. Ind. Orn. pl. 25 (1847); Kelaart, Prodromus, Cat. p. 118 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xiii. p. 172; Jerdon, B. of Ind. i. p. 229 (1862); Sharpe, P. Z. S. 1868, p. 270; id. Mon. Alced. pl. 40, p. 119 (1868–71); Holdsworth, P. Z. S. 1872, p. 424; Hume, Str. Feath. 1874, p. 173, et 1875, p. 51, et 1876, p. 287; Inglis, ibid. 1877, p. 19.

Alcedo erythaca, Gm. Syst. Nat. i. p. 449 (1788).

Ceyx erythaca, Blyth, Cat. B. Mus. A. S. B. no. 220, p. 50 (1849).

Ceyx microsoma, Jerd. Cat. B. S. India, Madr. Journ. 1840, xi. p. 231.

Martin Pêcheur de Pondicherry, Buff. Pl. Enl. 778. fig. 2.

The Three-toed Kingfisher, Europeans in Ceylon; *The Pinang Kingfisher*, Sharpe, Mon. Alced.

Dein-nygeen, Arracan; *Raja whodan*, Malay (Blyth).

Punchi Mal-pelihuduwa, Sinhalese.

Adult male and female. Length 5·25 to 5·4 inches; wing 2·1 to 2·3; tail 0·9; tarsus 0·35; innermost toe and claw 0·65; hind toe and claw 0·3; bill to gape 1·44 to 1·6, at front 1·3. Expanse 8·3.

Iris brown; bill coral-red; legs and feet coral-red, slightly paler than bill; claws yellowish.

Head, hind neck, face, lower back, rump, and tail with the least wing-coverts and under wing rufous, overlaid on the back, upper tail-coverts, and behind the eye with delicate shining lilac, and tinged with the same on the head: upper back black, overlaid with a patch of brilliant cobalt-blue; wings blackish brown; a spot at the side of the nape, a wash over the back and tertials, and edges of wing-coverts fine deep violet-blue; beneath the nuchal spot a white streak; forehead edged with deep blue at the bill; eyelid and a spot in front of eye black; outer web of 1st primary and edge of winglet, inner margins of quills, and base of secondaries pale cinnamon; chin, throat, and centre of abdomen flavescent whitish; rest of under surface saffron-yellow, shaded with rufous on the flanks. In some specimens the centre of the head wants the violet tinge, this part being plain rufous; others, probably not adult, have the tail tipped dark.

Obs. Ceylonese examples are identical in character with Indian and Malaccan. A Pegu specimen, recorded in 'Stray Feathers,' measures 2·2 in the wing and 1·55 in the bill from gape; another I have seen from Malacca, 2·3 in the wing and 1·6 in the bill from gape. A male example, with a similarly large bill, I procured at Kanthelai: but the average size of the bill in Ceylon specimens is about 1·45. Mr. Sharpe figures an example in his plate ('Monog. Alced.') with a brown tail, and remarks that it may be sexual or a sign of immaturity; it certainly is not the former, as I have sexed males and females without any trace of dark colour in the tail; and as to the latter the nearest approach to a dark tail in what appeared to be a young bird, from the state of the organs, was a dark tip of about $\frac{1}{20}$ inch in depth to the centre tail-feathers. It seems not unreasonable to infer that the coloration in the specimen figured by Mr. Sharpe was abnormal, and at the same time very remarkable.

To many of my readers who are not well acquainted with this beautiful genus of Kingfishers, it may not be uninteresting to peruse a short *résumé* of its members, taken from Mr. Sharpe's magnificent 'Monograph of the Kingfishers,' which I here give. Commencing with the species which ranges next to ours in its habitat, we have:—

Ceyx rufidorsa, Strickland, P. Z. S. 1846, p. 99; Sharpe, Mon. Alced. pl. 41. Indo-Malayan region.

Differs chiefly from *C. tridactyla* in having the back and wing-coverts of the same hue as the head, rump, and tail, which are lilac-rufous. Wing 2·2.

Ceyx dillwynni, Sharpe, P. Z. S. 1868, p. 591; id. Mon. Alced. pl. 43. Labuan.

Larger than the above; head, back, rump, and tail lilac-rufous; scapulars black, washed with blue. Wing 2·45.

Ceyx sharpii, Salvad. Atti R. Accad. Tor. 1869, p. 463; Sharpe, Mon. Alced. pl. 42. Borneo.

Nearly all the upper surface brilliant lilac-rufous, with a portion of the scapulars black, and the wing-coverts tipped with blue. Wing 2·3.

Ceyx solitaria, Temm. Pl. Col. 595; Sharpe, Mon. Alced. pl. 38. New Guinea and adjacent isles.
Back rich ultramarine; the head, tail, and wings chiefly black; bill black. Wing 2·1.

Ceyx cajeli, Wall. P. Z. S. 1863, p. 25, pl. v.; Sharpe, Mon. Alced. pl. 44. Bouru Island.
Chiefly black above, with the back and rump silvery blue; head and wing-coverts spotted with silvery blue. Wing 2·5.

Ceyx wallacei, Sharpe, P. Z. S. 1868, p. 270; id. Mon. Alced. pl. 45. Sula Islands.
A large species, chiefly black above, with the back very rich shining cobalt: distinguished by its black scapulars from the next. Wing 2·5.

Ceyx lepida, Temm. Pl. Col. 595; Sharpe, Mon. Alced. pl. 46. Ceram, Amboina, south-west coast of New Guinea.
Likewise a large species. Chief characteristics of upper plumage black, spotted with rich ultramarine on the head and hind neck; back "rich ultramarine." Wing 2·5.

Ceyx uropygialis, Gray, P. Z. S. 1860, p. 348; Sharpe, Mon. Alced. pl. 47.
Smaller than the above. Upper surface chiefly black, spotted minutely and striped with ultramarine on the head; back ultramarine; rump silvery blue. Wing 2·4.

Ceyx melanura, Kaup; Sharpe, Mon. Alced. pl. 39. Philippine Islands.
Above chiefly lilac-rufous, with a patch of feathers on each side of the neck blue, under which is another white patch; head spotted with lilac-blue. Wing 2·1.

Ceyx philippinensis, Gould, P. Z. S. 1868, p. 404; Sharpe, Mon. Alced. pl. 37. Philippine Islands.
Chiefly indigo-blue above, banded with light cobalt on the head and face; under surface deep rufous. Resembles the Indian Kingfisher somewhat in general appearance. Wing 2·3.

Distribution.—This diminutive and beautiful little Kingfisher is the rarest of the indigenous species of the family in Ceylon, occurring here and there in localities few and far between throughout the low country, and inhabiting the upland valley of the Mahawelliganga and its affluents to an elevation of about 2000 feet. I have procured it in forest on the Trincomalie and Anaradjapura road, near Kanthelai tank, and at Devilane in the Friars-Hood district. In 1875, while residing at Hurellé tank, Mr. Cotteril, C.E., met with a little flock of four, and it has been seen in the Mullaittivu district. Layard speaks of meeting with it at Galle, Trincomalie, Anaradjapura, Matale, Puttalam, and Ratnapura. I closely scrutinized the rocky streams and rivers during two years' wanderings in the jungles of the south-west, but never saw it, nor did I ever encounter it in any of the humid districts of the island, and am therefore convinced that it is chiefly to be found in the dry portions only. It is not uncommon in Dumbara; but is chiefly located, I imagine, down the valley, from Kandy towards the bend of the Mahawelliganga. Mr. Holdsworth "at various times obtained three specimens, which were killed in the central district;" and it has been described to me (whether correctly identified or not I cannot say) as inhabiting the tributaries of the Kelani in Lower Dickoya.

It is scattered all over India, but nowhere, says Jerdon, common. He procured it in the south of India, and remarks that it seems to be a coast-bird for the most part. Col. Sykes got it in the Deccan; but Mr. Fairbank does not appear to have met with it in that part. In the north-west of India it has not, that I am aware of, ever been found, its distribution being decidedly eastern. Mr. Ball does not even record it from Chota Nagpur or the Satpura jungles, and we next find it in the Sikhim Terai, and thence eastward in Cachar and Burmah. In Pegu Mr. Oates only found it on the eastern slope of the Pegu-Yama hills, where the country is covered with evergreen forest, in the deep-wooded nullahs of which it was not uncommon. In Northern Tenasserim Mr. Davison found it between Tavoy and Meeta Myo, at Karope, and near Ye. In the peninsula and the island of Pinang it is well known, and it has been procured at Ross Island, Andamans, and at Kondul, a small islet adjoining the Great Nicobar Island. It has been found in Java and Sumatra and some of the Indo-Malayan Islands, and Mr. Sharpe instances it as having been procured in the Philippines; but the last-named locality requires confirmation.

Habits.—The Three-toed Kingfisher, which is the loveliest of all Ceylon birds, is a shy and usually solitary species, delighting in the gloom of the forest, where it frequents the edges of tiny brooks and damp or swampy spots containing small water-holes, subsisting on diminutive fish and small aqueous insects. It is so small that it is next to impossible for the collector, however keen-eyed he be, to detect it on its little perch before it is alarmed and takes wing with a shrill piping note, glancing instantaneously round the nearest tree to a place of safety. It is consequently very difficult to procure; but in the evening, just as darkness is setting in and the jungle becomes gradually enshrouded in gloom, it becomes restless and noisy, continuing to whistle

and fly from place to place round its diurnal position until dark, and may then be watched and easily shot. Unless when breeding it is always found alone; and though it frequents the banks of streams and rivers in the jungle, it evidently prefers the interior of the forest to the vicinity of exposed water. We find Mr. Inglis noting it, in Cachar, as affecting thick jungle with small streams running through it; and at Devilane I procured one of my specimens frequenting the jungle through which the sluice-stream ran, and rejecting completely the open water of the tank which abounded with fish. Mr. Inglis observes that they sit very close, and that he has more than once attempted to catch them with his hand. This is an illustration of the many instances in which the habits of different species vary entirely according to the district or country which they inhabit, for, as I have just remarked, this is a very shy bird in Ceylon. I have been told that the Singhalese occasionally catch it on the Mahawelliganga, but in what manner I do not know.

No information appears as yet to have been acquired concerning the nidification of this little Kingfisher.

PICARIÆ.

Fam. MEROPIDÆ.

Of small size. Bill long, slender, curved, both mandibles much pointed. Wings long and pointed. Tail with the central feathers often elongated. Legs and feet feeble.

Sternum with two emarginations on the posterior edge.

Genus MEROPS.

Bill much lengthened, slender, acute, compressed from the nostrils to the tip; both mandibles curved gently throughout. Nostrils oval, basal, placed midway between the margin and the culmen, partially protected by short bristles; rictal bristles short and stiff. Wings long and pointed; 1st quill minute, 2nd the longest. Tail of 12 feathers, even at the tip, or with the two central rectrices prolonged beyond the rest and much attenuated. Tarsus short, covered in front with transverse scales. Feet with the lateral toes joined to the middle, the outer beyond, and the inner as far as, the last joint; claws curved and hollowed beneath.

MEROPS PHILIPPINUS.

(THE BLUE-TAILED BEE-EATER.)

Merops philippinus, Linn. Syst. Nat. ed. xiii. tom. i. p. 183 (1767); Lath. Ind. Orn. tom. i. p. 271 (1790); Blyth, Cat. B. Mus. A. S. B. p. 52 (1849); Kelaart, Prodromus, Cat. p. 118 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 173; Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 87 (1854); Gould, B. of Asia, pt. vii. (1855); Holdsworth, P. Z. S. 1872, p. 422; Legge, Ibis, 1875, p. 281; Hume, Nests and Eggs, i. p. 101; id. Str. Feath. 1876, p. 287.

Merops javanicus, Horsf. Trans. Linn. Soc. xiii. p. 294 (1820).

Merops daudinii, Cuv. Règn. An. 1829, t. i. p. 442.

Merops philippensis, Jerd. B. of Ind. i. p. 207; Blyth, Comm. Jerd. B. of Ind., Ibis, 1866, p. 344; Legge, Ibis, 1874, p. 13.

Grand Guêpier des Philippines (juv.), Buffon, Pl. Enl. 57; *Le Guêpier Daudin* (juv.), Levaill. pl. 14, p. 49; "*Flycatcher*" of Europeans in India and Ceylon.

Boro-putringa, Beng.; *Burra-putringa*, Hind.; *Komu passeriki*, Tel. (Jerdon); *Kachangan*, Java (Horsf.); *Berray Berray*, Malay; *Shale*, Nicobarese (Davison).

Kurumenne kurulla, lit. "Beetle-bird," Sinhalese; *Kattalan kuruvi*, lit. "Aloe-bird" *, Tam.; *Pappugai de Champ*, Portug., lit. "Ground-Parrot" (*apud* Layard).

Adult male and female. Length 12·0 inches; wing 5·0 to 5·4; tail 5·9, central feathers 2·3 longer than the rest; tarsus 0·45 to 0·5; mid toe and claw 0·85; bill to gape (straight) 2·0 to 2·1. Expanse 16·75.

Iris scarlet; bill black; legs and feet blackish, hinder part of tarsus paler.

Head, back, and sides of neck, back, scapulars, and wing-coverts shining brownish green, brownest on the head and hind neck, and passing into the bright green-blue of the rump and upper tail-coverts: external edges of the primaries and secondaries greenish blue, the remaining portion of the feathers pervaded with brown, which changes at the basal part of the inner webs into cinnamon-rufous; tips of the shorter primaries and of all the secondaries blackish brown; terminal portion of the tertials and the tail (with the exception of the blackish elongated tips of the central feathers) bright greenish blue, the rectrices brownish internally.

A broad black streak from the gape over the eye and ear-coverts, above it a faint line from the forehead to the posterior corner of the eye, and beneath it a broader stripe of bright greenish blue, the latter very pale at the termination; chin and upper part of throat yellowish; fore neck chestnut-colour, gradually changing into the faded greenish of the breast, which brightens into cerulean blue on the under tail-coverts; the basal portions of the under-surface feathers light brownish, showing more or less throughout; under wing concolorous with the cinnamon bases of the quills; shafts of the quills and rectrices white beneath.

Young. Iris dull red or brownish red, changing into the hue of the adult during the first year.

Above greener than the adult; the bases of the feathers brownish green; rump and upper tail-coverts not so bright as in the adult; central rectrices not elongated, but slightly exceeding the rest and more pointed at the tips. The blue loral and cheek-stripes less conspicuous, and the chin not so yellow as in the adult; under tail-coverts paling at their lateral margins.

The above is the plumage of the young birds arriving in Ceylon in September; they quickly acquire the adult tail, and meanwhile the normal yellowish feathers of the chin and the chestnut ones of the throat make their appearance, the latter part in the quite young bird being much paler than in the adult.

Obs. I have examined some examples from Sumatra, and one or two from India, in the British Museum, which have

* According to Layard from a fancied resemblance in the tail of this bird to the aloe-plant.

the blue cheek-stripe broader than in any I have procured in Ceylon. Philippine specimens are identical with Ceylonese in plumage, but they are a smaller race; the wing of a Negros example is 4·9 inches, another 5·0. A Sumatran example measures 5·2 inches; two from Japan 5·15 and 5·25 respectively.

Distribution.—This fine Bee-eater, migratory to Ceylon, arrives in the north of the island about the beginning of September, and rapidly spreads more or less through all parts of it before the end of the month. It seems to find its way to the south-west corner, or Galle district, almost as soon as to any part of the island, and collects there in greater numbers than elsewhere on the western side. I have met with it in the interior of the country, between Galle and Akurresse, as early as the 8th of September. It locates itself in great numbers in the Jaffna peninsula, and on the north-west coast as far south as Puttalam, and spreads in tolerable numbers into the interior, passing over the forest-clad portions, however, to a great extent, and ascending to the patnas and open hills of the Kandyan Province. In Uva and Pusselawa and on the Agra, Lindula, and Bopatalawa patnas, at an elevation of 5000 feet, it is common; but I have never seen it on the "plains" of the Nuwara-Elliya plateau. In the Eastern Province it confines itself mostly to the sea-board, being less numerous in the Park country and the south-eastern "jungle-plain" than the next resident species. Its departure from the island is as sudden as it is regular, in proof of which I may state that at Galle, in two successive seasons, I observed it collect in large flocks between the 29th and 31st March, and disappear entirely on the 1st April. Mr. Holdsworth, who writes that at Aripu it was so abundant that the common resident species (*M. viridis*) was scarce in comparison with it, states that it left about the beginning of April; and by the end of that month I believe it has quitted the island entirely. In the neighbourhood of Colombo it is chiefly located in large tracts of paddy-ground and about the great swamp between there and Negombo. It is now and then met with in the cinnamon-gardens.

The Blue-tailed Bee-eater is found throughout most of the empire of India, being very generally distributed throughout the central and eastern portions of the peninsula during the cool season, while in the breeding-time it locates itself in those parts which furnish it with localities suitable to its nesting-habits. In some places it is rare: Mr. Fairbank met with it but once in the Khandala district; and it is mostly replaced by the Egyptian Bee-eater in the north-west, for though it "often occurs," according to Mr. Hume, in the Mount-Aboo district, it is neither found in Northern Guzerat nor in Sindh. In Chota Nagpùr it appears to be local; but Mr. Ball writes, in 'Stray Feathers,' 1875, that he met with large numbers in the vicinity of a river in that region in April, and that he infers that they were breeding there. To the eastward of India this species is found in Tenasserim and Burmah, and likewise in the Malay peninsula, taking into its range the Nicobars and South Andamans. Further south still it is found in Java, Sumatra, Flores and Timor, and the Philippine Islands, and has been met with in China and Formosa by Mr. Swinhoe.

Habits.—In Ceylon this species prefers to frequent open lands, plains studded with bushes near the sea-shore, esplanades, paddy-fields, swamps, and the patnas of the hill-region. It passes a great part of its existence on the wing in pursuit of insects, after which it dashes with a very rapid flight, constantly uttering meanwhile its loud notes. When reposing from its labours, it rests on low objects, such as stumps of trees, fences, low projecting branches, little eminences on the ground, and often on the level earth itself. It is tame in its nature, allowing a near approach before it takes wing. On rainy evenings in November and December, when the air is swarming with insects, and particularly with winged termites, which issue forth from their nests on such occasions, the Blue-tailed Bee-eater congregates in large flocks on the wing, dashes to and fro for hours together, ascending to a great height in pursuit of its prey, and keeping up its not unpleasant notes without intermission. When exhausted with these exertions, they settle on walls, trees, or the ground in little parties, and when rested resume their flight. I have seen such flocks as these night after night on the Galle esplanade, and often observed them flying round and round high above the fort before finally moving off for the night to some distant and common roosting-place. When its prey consists of beetles, dragonflies, or other large insects, which it espies from its perch, it is captured after a sometimes prolonged flight, brought back, and killed before being swallowed by being repeatedly struck against whatever object the bird is seated on. This may often be witnessed when the bird is perched on telegraph-wires, which are a very favourite look-out with it. I have seen it dash on to the surface of ponds and rivers, and seize insects which were passing over the

water. Mr. Holdsworth has observed it hunting close to the surface of the sea, at a distance of a quarter of a mile from the shore. Jerdon notices its habit of congregating together, and writes that on one occasion he saw an "immense flock of them, probably many thousands, at Caroor, on the road from Trinchinopoly to the Nilghiris." They were sallying out from the trees lining the road for half an hour or so, capturing insects, and then returning to them again. As a rule they do not consort in close company, but live in scattered flocks of about half a dozen, and often one or two birds constantly frequent the same locality. The note is difficult to describe. Jerdon not inaptly speaks of it as "a full mellow rolling whistle." This Bee-eater retires late to roost, collecting to one spot from many miles round, and forming a large colony which pass the night in thickly foliaged trees or bushes. On Karativoe Island I discovered one of these roosting-places; the birds were flying over from the mainland some miles distant, and continued to arrive from various points on the opposite coast until it was too dark to distinguish them on the wing. They resorted to the borders of a small back-water beneath the high sand hills of the island, which was lined with mangrove-trees, the thick branches of which afforded them a safe refuge.

Nidification.—Mr. Hume writes, in 'Nests and Eggs' (Rough Draft), that "the Blue-tailed Bee-eater breeds from March until June pretty well all over continental India, in well-cultivated and open country. Like all the rest of the family it breeds in holes in banks, and lays usually four or five eggs. The holes are rarely less than four feet deep, and I have known them to extend to seven feet. At the far extremity a rounded chamber, as a rule not less than six inches in diameter, is hollowed out for the eggs, and at times this chamber has a thin lining of grass and feathers, which I have never yet met with in the nests of the other species." The banks of the Nerbudda, Mahanuddee, Ganges, a stream near Baraich, and localities at Lahore, Nujgeebahad, and Mirzapore are cited as breeding-places of the species; and Mr. Hume himself found a colony established in a railway-cutting at Agra, where the engines "passed twenty times a day within two feet of the mouths of the holes." The eggs are white, highly glossed, and very spherical ovals, averaging 0·88 by 0·76 inch.

MEROPS VIRIDIS.

(THE GREEN BEE-EATER.)

Merops viridis, Linn. Syst. Nat. i. p. 182 (1766); Bonn. Enc. Méth. Orn. pt. i. p. 273, pl. 105. fig. 3 (1790); Sykes, Cat. no. 23, J. A. S. B. iii. (1834); Blyth, Cat. B. Mus. A. S. B. no. 236, p. 53 (1849); Kelaart, Prodromus, Cat. p. 119 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 173; Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 84 (1854); Gould, B. of Asia, pt. vii. (1855); Jerdon, B. of Ind. i. p. 205 (1862); Holdsworth, P. Z. S. 1872, p. 422; Hume, Nests and Eggs, p. 99 (1873); Adam, Str. Feath. 1873, p. 371; Hume, ibid. 1875, p. 49; Legge, Ibis, 1875, p. 281; Oates. Str. Feath. 1876, p. 304; Dresser, B. of Europe, pt. 51 (1876).

Merops orientalis, Lath. Ind. Orn. Suppl. p. 33 (1801).

Merops indicus, Jerd. Madr. Journ. xi. p. 227 (1840).

Merops torquatus, Hodgs. Gray's Zool. Misc. 1844, p. 82.

The Indian Bee-eater, Edwards, pl. 183.

Le Guêpier à gorge bleue, Levaill. pl. 10. p. 39.

The Common Indian Bee-eater (Jerdon); *Flycatcher*, Europeans in India and Ceylon; *Hurrial*, *Patringa*, Hind.; *Bansputtee*, lit. "Bamboo-leaf," Bengal; *Chinna passeriki*, Tel., lit. "Small green bird" (Jerd.); *Mo-na-gyee*, Arracan (Blyth).

Kurumenne kurulla, Sinhalese; *Kattalan kuruvi*, Tamils in Ceylon.

Adult male and female. Length 9·5 to 10·5 inches, according to length of tail; wing 3·6 to 3·8; tail 5·1, central feathers 2·0 to 2·3 longer than rest; tarsus 0·4; middle toe and claw 0·6; bill to gape 1·4 to 1·55.

Iris scarlet; bill black; legs and feet brown, the edges of scales whitish.

Above leaf-green with a bronze lustre, paling to bluish green on the tertials, rump, and upper tail-coverts; basal or concealed portion of the head- and nape-feathers golden fulvous, showing on the surface at the occiput and nape: quills deeply tipped with blackish; inner webs of secondaries and borders of those of primaries pale cinnamon, which is likewise the colour of the under wing; tail green, with the tips of the shorter and elongated portion of the central feathers blackish.

A broad black stripe from nostril and gape over the eye and ear-coverts; above it a narrow yellowish-green supercilium; chin and throat greenish turquoise-blue, deepening into brownish green on the upper breast, and paling into bluish green on the lower parts and under tail-coverts; across the throat a conspicuous black band, edged above and beneath with bright yellow-green; vent whitish.

Birds in old plumage have the nape and occiput much yellower than those in good feather, the paler colour being the result of abrasion; this must not, however, be confounded with the fine aureous lustre observable in some specimens, particularly those from N.E. India and Burmah.

Young. Iris light red or yellowish red; bill generally pale at the base beneath; legs and feet blackish slate. Central tail-feathers not lengthened.

Above green, the feathers edged with bluish; aural stripe blackish brown; throat, neck, and chest greenish blue, palest on the chin: lower breast and belly albescent; under tail-coverts bluish green. Some nestlings have the throat tinted with yellowish. The black throat-bar is acquired at a very early age, but is narrow and ill-defined, and in some edged with blue; the long central tail-feathers are likewise acquired, about the same time, by a "nestling" moult, although tolerably old yearlings may now and then be seen without them.

Obs. Ceylonese specimens of this Bee-eater vary, as above mentioned, in the golden hue of the nape and hind neck. but do not exhibit the brilliant hue of birds from Cachar and Burmah, to which Hodgson gave his name of

ferrugineiceps: they are typical *M. viridis*, like birds from Central and Southern India; but it must be remarked that occasionally very rufous-headed specimens are procured in Madras. That the species is variable in this character throughout its entire habitat may be gathered from the fact, demonstrated by Mr. Hume, of the Sindh race almost wanting the rusty golden tinge. In Ceylon I have observed that nestling birds vary in the extent of the brighter colours of their plumage when these are first put on, the development of such tints depending perhaps on the physical vigour of the individual. I once shot a pair of young green Bee-eaters together, which were, of course, out of the same nest—one with the normal plain green throat and short tail of the nestling, the other with the blue throat-band appearing and the central tail-feathers half-grown. Perhaps the latter would always have been a more brilliantly plumaged bird than the former; for the difference in age, at most 24 hours, could scarcely have accounted for the backwardness of the plainer specimen in acquiring its adult character. As regards the relative size of Indian and Ceylonese birds, I find that the wings in 8 specimens from Pegu (as given in 'Stray Feathers') vary from 3·6 to 3·8 inches, precisely the measurements given above for Ceylonese birds. Some Indian examples have the central tail-feathers longer than any I have seen in Ceylon; one specimen from Kamptee in the British Museum has them 2·6 inches beyond the adjacent pair, 2·3 being my limit. The dimensions given by Mr. Armstrong of the wings of several Burmese specimens, viz. 4·6 to 5·2 inches, are most probably those of some other species entered by a printer's error in his note on *M. viridis*.

Concerning the species in North Africa, Mr. Dresser writes that examples from Egypt, India, and Abyssinia all have the throat markedly green and the head but slightly tinged with rufous. This is, of course, to be expected, in continuation of the characters displayed by the westernmost of Indian birds, viz. those from Sindh. He further remarks that, according to his experience, Indian specimens have, as a rule, the throat tinged with verditer-blue, and that those from Ceylon exhibit this character to a still greater extent: this, however, is with us somewhat variable, as I have demonstrated above.

Distribution.—The Green Bee-eater is a resident species and very numerous in all the dry parts of the low country. It is most abundant about open scrubby land near the sea-coast round the north of the island and along the south-east and eastern sea-boards. Its habitat seems to be restricted to a nicety by the influence of climate. It is common in the interior of the northern half of the island, as well as in the maritime regions, and can be traced along the foot of the western slopes of the Matale ranges from Dambulla to Kurunegala, and thence across the dry country on the north of the Polgahawella and Ambepussa hills to Chilaw and Madampe, near which it stops, not being found south of Nattande. So much does it avoid a moist atmosphere that it extends for a few miles south of Kurunegala, on the high road to Polgahawella, and suddenly vanishes on the road entering the hills. South of these limits it is unknown throughout the Western Province and the south-west hill-region, reappearing again just to the eastward of Tangalla, where the climate again becomes dry; beyond this all round the coast it is common, being particularly numerous in the Hambantota and Yāla districts. I have traced it through the interior to the foot of the Haputale hills, but it is much scarcer there than at the sea-coast. In the Eastern Province it inhabits the high cheenas in the neighbourhood of Bibile, which attain an altitude of 1000 feet, and which is the highest point I have found it to attain in Ceylon. Mr. Holdsworth remarks, *loc. cit.*, that it occurs about Colombo. I conclude that the evidence on which this place is included in its range must be that of a stray bird; for I have never observed it anywhere nearer to it than the above limits, neither has Mr. MacVicar nor the taxidermist of the Colombo Museum, both of whom have collected for many years in that part.

This species is spread all over India, extending into Burmah, Tenasserim, Arrakan, and the Indo-Chinese countries. It is common in the south of the Peninsula and ascends the hills. Mr. Fairbank procured it at the base of the Palanis, and Mr. Davison has shot it at an elevation of 6000 feet above the sea in the Nilghiris and found it breeding at about 5000 feet. In the Deccan and Khandala district it is common according to Mr. Fairbank, and the same is true as regards the north-west of India; for Mr. Adam records it as very plentiful about the Sambhur Lake, and Mr. Hume found it pretty common all the year round in Upper Sindh, though comparatively rare in Lower Sindh. It is found along the base of the Himalayas, but does not extend to any elevation. In Chota Nagpur it is one of the "most abundant of birds." In Cachar Mr. Inglis says it is common between August and April, in which latter month a large number migrate. In Pegu it is extremely numerous in the low country, but not in the hills. In Tenasserim it is generally distributed; but it is absent from the islands of the Bay of Bengal, where our other two species are found. It appears to be a seasonal visitant to the neighbourhood of Calcutta, for Capt. Beavan records

that it arrives at Barrackpore in October. Westward of India it extends through Beluchistan and Persia to Northern Africa, and there is not uncommonly found in Egypt, Nubia, and Abyssinia.

Habits.—This is one of the most charmingly fearless little birds in Ceylon; unlike the last it is very terrestrial in its habits, perching all day on some little bush or low stick near the ground, and sallying out like a Flycatcher after its food, when it at once returns to its perch or sweeps off to another close by. It is generally found in pairs, or three or four in scattered company, which frequent roadsides and dry open ground of all description where they can find objects to take up their watch upon. About Trincomalie, and, in fact, anywhere on the sea-coast of the eastern side of the island, it is very fond of the sandy scrubby wastes lining the sea-beach, and is so tame that it may be almost knocked down with a stick, so near an approach will it allow before taking wing. In the interior a favourite locality with it is the dried-up paddy-fields in the neighbourhood of the village tanks. It roosts in little colonies, retiring early to rest and congregating in close company; it resorts usually to the same tree, round which much noisy preparation goes on—flying up and wheeling round, alighting on a neighbouring tree-top and then returning, after which the little flock will start out again from the branches and make another little detour, keeping up all the while a continuous clamour. Its note is a sweet little chirrup, unlike the loud voice of the last species. It is either uttered when the bird is perched or when it is sailing along in pursuit of an insect, which it seizes with an audible snap of its bill. It usually preys on small flies or minute Coleoptera, avoiding large dragonflies and other giants of the insect kingdom, upon which the last species feasts and beats to death in the manner aforementioned. Jerdon says that he has seen one occasionally pick an insect off a branch or a stalk of grain or grass; and Blyth has seen them assembled round a small tank seizing objects from the surface of the water, after the manner of a Kingfisher. I have also observed them about rushy jheels and small tanks, but they are not particularly partial to the vicinity of water.

Nidification.—This Bee-eater breeds in the sand hills at Hambantota and other similar localities in Ceylon. I found the young fledged, on the south-east coast, in June, but did not succeed in finding any nests. The nesting-time is in April and May. Mr. Hume says that it prefers to breed in sandy banks or cliffs, but that he has found the nest in a mud wall, and once in a perfectly level barren plain. It cuts the hole, after the manner of the last species, with its bill, scraping away the loose earth with its little feet, and sometimes excavates to a depth of 5 feet, the passage increasing in width and often, according to Mr. Adam, declining at an angle of 30° from the entrance to the egg-cavity, which is about 3½ inches in width. No nesting-materials are used, the eggs, which vary from three or four (the usual number) to seven, being laid on the bare ground. The eggs are nearly spherical in shape, milky white, and "brilliantly glossy." The average size of a large series is 0·78 by 0·7 inch.

MEROPS SWINHOII.

(THE CHESTNUT-HEADED BEE-EATER.)

Merops quinticolor, Vieillot, N. Dict. xiv. p. 81 (1817); Kelaart, Prodromus, Cat. p. 119 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 174; Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 88 (1854); Jerdon, B. of Ind. i. p. 208; Holdsworth, P. Z. S. 1872, p. 423; Walden, Ibis, 1873, p. 301; Legge, Ibis, 1874, p. 13.

Merops erythrocephalus, Brisson, Av. iv. p. 563; Blyth, Cat. B. Mus. A. S. B. p. 53 (1849); Swinhoe, P. Z. S. 1871, p. 348.

Merops swinhoei, Hume, Nests and Eggs (Rough Draft), p. 102; id. Str. Feath. 1874, p. 163; Ball, ibid. p. 386; Armstrong, ibid. 1876, p. 305.

Le Guêpier quinticolor, Levaillant, Hist. Nat. Guêpiers, p. 51, pl. 15 (ex Ceylon).

The Fire-coloured Bee-eater, Kelaart, Prodromus; "*Flycatcher*" of Europeans in India and Ceylon.

Kurumenne kurulla, Sinhalese, Southern Province; *Pook-kira*, Sinh., N.W. Province.

Adult male and female. Length 8·4 to 8·6 inches; wing 4·2 to 4·3; tail 3·3; tarsus 0·45, middle toe and claw 0·65; bill to gape 1·6 to 1·8.

(In this species the tail-feathers are not elongated, but the tail is somewhat sinuated, the central pair being rounded at the tips and longer than those adjacent, though shorter than the laterals.)

Iris scarlet; bill black; legs and feet dark vinous brown or purplish brown.

Head, hind neck, sides of the same, interscapular region, and upper edge of black throat-band bright chestnut; wings and tail dull green, edges of wing-coverts, terminal portion of tertials, and edges of rectrices bluish; rump and upper coverts pale cerulean blue, tips of the longer-coverts darker; tips of quills and rectrices, with the exception of the centrals, brownish black; inner webs of secondaries, borders of those of primaries, and under wing cinnamon-red as in the other species.

A black facial stripe, narrower than in the last, passing from the gape beneath the eye; chin and throat rich saffron-yellow; black throat-band bordered beneath with golden yellow; beneath this the underparts are green, passing into pale greenish blue on the lower breast, abdomen, and under tail-coverts.

Young. Birds of the year have the chestnut of the upper surface paler, the throat whitish, the black band ill-defined and slightly edged with yellow beneath, the wing-coverts and secondaries margined with blue, and the chest greenish blue like the lower parts. The nestlings, which are blind for the first few days, quickly acquire the feathers of their first plumage as here described.

Obs. This species was first made known from Ceylon—that is to say, specimens were sent to Levaillant from there, and the bird was named by him, in his work on the 'Guêpiers,' the *Guêpier quinticolor*; but by some oversight he gave a plate of the species inhabiting Java, and accompanied it by a description, in which he stated the colour of the throat to be "d'un jaune jonquille, lequel jaune est terminé au bas par un collier noir," making no mention of the triangular chestnut throat-patch above the black mark, which character is wanting in the Javan bird, as it likewise is in his plate. His plate and description did not therefore apply to the Ceylon bird, nor can Vieillot's name, which was founded on the plate. *Merops quinticolor* accordingly is the Javan bird, and not the Indian. The matter has been referred to by the late Mr. Swinhoe and Lord Tweeddale in the references above given, and Mr. Hume gave the Indian bird its present title in his notice of it in 'Nests and Eggs,' as it was without a name. Ceylonese examples correspond with Indian and Burmese in size and likewise in coloration of the throat, though individuals from any district will differ *inter se* in this latter respect. One specimen I have examined in the British Museum from Madras has a wider black throat-band than any I have seen from Ceylon. Pinang specimens correspond with Ceylonese.

Distribution.—This handsome Bee-eater is sparingly dispersed over the island, inhabiting some localities

in considerable numbers, while in other districts mere stragglers are met with. In the south it is common on the Gindurah river, commencing above Baddegama and extending up into the hills of the Hinedun Pattu; it likewise frequents the banks of the Kaluganga, Kelaniganga, and Maha-oya in the Western Province, and is found here and there through Saffragam. To the north of these localities it is located about Kurunegala, on the Deduru-oya, in the Puttalam district, and in isolated spots in the neighbourhood of Dambulla. Mr. Parker has met with it in the Anaradjapura district, and it occurs sparingly throughout the northern forests. I have seen it between Trincomalie and Mullaittivu, but I do not think it is to be found much to the north of the latter place. In the Kandyan Province it is much more common than in most parts of the low country, inhabiting the vale of Dumbara, Deltota, Nilambe, Maturatta, and Uva generally. It does not ascend to the Nuwara-Elliya plateau.

This species is found in most of the forest-districts of India, Burmah, and Tenasserim, inhabiting the Andamans and extending to Pinang. Jerdon writes that it occurs in the Malabar forests and adjoining mountains, and is not uncommon in the Wynaad and other elevated wooded districts. I notice that Mr. Bourdillon did not procure it in the Travancore hills, nor Mr. Fairbank in the Palanis. The latter gentleman found it on the sides and base of the Goa and Savant-Wade hills, and records it as an inhabitant of the entire west coast as far north as Guzerat, whence, however, I do not observe that it has been procured. Capt. Marshall writes, in 'The Ibis,' 1872, that it is found in the Doon and the Terai, and along the whole of the southern skirts of the Himalayas to the valley of the Brahmapootra. In Chota Nagpur it is rare, Mr. Ball recording the occurrence of a single pair only; in Cachar it is migratory, being common during April and May: in Southern Pegu it occurs very sparingly; Mr. Armstrong met with it there in the month of February: at Thayetmyo Captain Feilden says it is rare, and in the plains of Pegu Mr. Oates did not meet with it at all. Mr. Davison found it throughout Northern Tenasserim, and in the Andamans he procured many specimens, meeting with it in Port Blair, Great and Little Cocos Islands, &c., but in the Nicobars it was not found.

Habits.—The banks of rivers which flow through forest or the borders of jungle-begirt tanks are the favourite localities of this bird in the low country. In the Central Province I have seen it principally in the vicinity of rivers in the deep valleys leading to the Mahawelliganga, on roads leading through jungle, and in spots studded with high trees on the sides of steep ravines. It is usually in pairs, and is very arboreal in its habits, sitting on the topmost or most outstretching branches of high trees overhanging water, and darting thence on its prey, much after the manner of a Flycatcher. It takes short flights, and often returns to the same perch again. It is a very pretty object, with its bright green plumage and glistening rufous head, as it darts from the fine old trees lining the forest-rivers down to the edge of the sparkling stream, and glides over the sandy bed, quickly catching up some passing insect. A pair may sometimes be seen seated on a dead twig, touching one another, so very sociable is it in its disposition. It has a soft note, differing from that of either of the foregoing species, which it generally utters from its perch.

Nidification.—I found the nest of this bird on the banks of the Gindurah in the month of April. The hole was excavated in the soft mould near the top of the bank, went in about 2 feet, with an average diameter of 2 inches, and at the end widened into a cavity 4 or 5 inches in height and nearly double that in width. There were four young ones lying on the bare ground, which was swarming with living maggots, ants, and flies, brought in for their food by the old birds. The nestlings showed a marked difference in age; two were perhaps not three days old, and the others had the green scapular feathers already sprouting. Layard found the nest in the same month, and says the eggs are two in number.

Mr. Davison writes that the hole is sometimes 6 feet in depth when excavated in sand, and that some turn off at a right angle, while others take a circular direction. The eggs are stated to vary from four to six in number, and to be pure white, very glossy, and nearly spherical in shape; they average 0·87 by 0·76 inch. The old birds are said to sit very close, allowing themselves to be dug out.

PICARIÆ.

Fam. CYPSELIDÆ.

Bill very small, but with the gape enormous, unfurnished with rictal bristles; tip hooked. Wings very long and pointed, with ten primaries. Tail variable, short and even, or long and much forked, of ten feathers. Legs and feet small and feeble; hind toe either directed forward or more or less reversible to the front.

Sternum with the keel very deep. Humerus very short. Throat furnished with large salivary glands.

Genus CHÆTURA.

Bill very small, triangular, the gape receding far back and very wide; culmen curved, flattened at the base, the tip hooked. Nostrils exposed. Wings very long and pointed. The humerus and ulna very short; the 1st quill the longest; the inner very short, imparting a sickle-shape to the wing. Tail short, even or rounded at the tip; the shafts rigid, very acute, and projecting some distance from the web. Tarsus short, stout, feathered just below the knee, and the rest covered with a naked skin. The three front toes nearly equal, the hallux directed backward but reversible to the front; claws stout, deep, and much curved.

CHÆTURA GIGANTEA.

(THE BROWN-NECKED SPINE-TAIL.)

Cypselus giganteus (V. Hasselt), Temm. Pl. Col. 364 (1825).
Acanthylis caudacuta, Blyth, Cat. B. Mus. A. S. B. p. 84 (1849); Kelaart, Prodromus, Cat. p. 118 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 170.
Acanthylis gigantea, Jerd. B. of Ind. i. p. 172 (1862); Holdsworth, P. Z. S. 1872, p. 419; Ball, Str. Feath. 1873, p. 55; Legge, Ibis, 1875, p. 280; Tweeddale, Blyth, B. Burmah, ext. no. 1875, p. 84. no. 183.
Chætura gigantea, Sclater, P. Z. S. 1865, p. 608.
Chætura indica, Hume, Str. Feath, 1873, p. 471, et 1876, p. 286.
Hirundinapus giganteus, Walden, Ibis, 1874, p. 131.
The Needle-tailed Swallow, Lath. Gen. Synopsis; *The Spiny-tailed Swift*, Kelaart.
Wæhælaniya, Sinhalese.

Adult (from three Ceylonese specimens). Total length, estimated from skins, 9·5 inches; wing 7·8 to 7·95, reaching 1·5 beyond tail when closed; tail 2·7 to 2·9, bare shafts of central feathers 0·35 to 0·4; tarsus 0·65 to 0·7; middle toe 0·5, its claw (straight) 0·35; bill to gape 1·0.

Iris brown; bill blackish or dark brown; legs and feet livid brown or fleshy purple, claws blackish brown.

Head, back and sides of neck, upper part of back, anterior scapular feathers, wings, sides of rump, and upper tail-coverts shining green-black, glossed on the wing-coverts, secondaries, and sides of rump more or less with blue; back

whity brown, of variable paleness, blending into the surrounding green; inner margins of quills and tertials light mauve-brown, palest on the latter; shafts of tail-feathers blackish brown.

Lores intense black, between which and the nostril there is a whitish or whity-brown spot; throat a corresponding pale colour—that is, lightest in those birds which have the palest frontal spots; beneath umber-brown, glossed obscurely with green, and blending gradually on the throat into the pale hue of the chin; under tail-coverts and a broad streak leading from them above the flank to opposite the centre of the back white; shafts of under tail-coverts black; under wing-coverts pale mouse-brown.

Young. Immature birds have the frontal patches scarcely discernible, the head browner than the adult, the back darker, and the under surface less suffused with green.

Obs. This Swift is variable in the pale markings about the face and chin, in the light hue of the back, and in the extent of the blue gloss on the upper plumage. I have examined a series from Labuan, Malacca, Singapore, and South India, and I find that the dark-backed birds, which are evidently not fully aged, have the chin and loral spots of a correspondingly dark hue. Mr. Hume has separated the Indian birds as *C. indica*, on account of their more pronounced white chin and frontal patches, as distinguished from what he considers to be true *C. gigantea* from Java, without the white chin. If the type from this island had not the whitish markings it must have been, in all probability, an immature bird. Temminck's plate shows no white nostril-patches; but in those days artists were not particular.

I am not conversant enough with Indian specimens to say whether they never show an absence of the white patches either as young birds or as individuals; but those from all other quarters, as I have just remarked, vary in this respect. Birds from each end of the geographical limit of the species, viz. from India and Celebes, have the white spots alike, which argues in favour of there being but one species. Two examples from Labuan measure 8·1 and 8·2 inches in the wing; one is a dark-backed bird, the other a light one, and the chin and forehead tally with the back in each: two from Malacca measure 8·1 and 7·9 inches in the wing; one has a dark back and no loral spot, the other is slightly paler and has an indication of the light patches. One from Singapore measures 7·9 inches, has a very dark back, no frontal patches, and a dull brown under surface; it is evidently a young bird. Another from the Nilghiris is entirely a pale bird, with light chin- and nostril-spots. Lord Tweeddale finds that adolescent examples from the Andamans agree with Malaccan ones in his collection.

Distribution.—The Brown-necked Spine-tail is a resident in the Ceylon hills, wandering at uncertain times during its day's peregrinations over the whole island. In the upper ranges it is most often seen frequenting the Horton, Nuwara-Elliya, Kandapolla, and Elephant Plains, over which it dashes at one moment, while at the next it sweeps round the adjacent hills in its headlong course. It is frequently noticed in the coffee-estates in the surrounding districts. Mr. Elwes writes that it is often seen in Dimbulla; and Mr. Bligh, who observes it yearly in the Haputale gorges, tells me that it comes into that district to breed usually about the month of April. It inhabits the Morowak-Korale and Kukkul-Korale hills, in which I have seen it in various months, and I have no doubt it breeds there in sequestered places. I have seen it in large flocks on the sea-coast at Tangalla, and Capt. Wade has met with it at Yāla. On one occasion, too, I encountered it in the north of the island. It hawks, as I have seen *C. caudacuta* in Australia, at an enormous height, and when rained on by a monsoon shower descends to earth, and is thus seen for a few minutes in the low country, vanishing again on the return of sunshine. Layard knew it principally from Nuwara Elliya.

In India Jerdon observed it chiefly in the south of the peninsula, specifying the Nilghiris, Malabar, and the Wynaad as the localities where he met with it. Mr. Carter found it during the S.W. monsoon at Coimbatore, Salem, and on the Anamully hills at various elevations up to 6000 feet. The species does not seem to extend into the north of India, where its Australian and Chinese congener, *C. caudacuta,* singularly enough, is found in considerable numbers. Our bird inhabits Tenasserim, and Mr. Inglis obtained it in Cachar. It is common in the Andamans, but has not been procured in the Nicobars. It extends down the Malay peninsula (taking in Pinang) to Singapore, and thence to Java, Labuan, Borneo, and Celebes, to the south-east of which latter group it has not yet been observed.

Habits.—This magnificent Swift and its Australian ally are the swiftest creatures in existence, excelling all other living beings to such an extent in their powers of locomotion that they cannot fail, as the per-

fection of an all-wise Creator's handiwork, to excite wonder and admiration in the mind of the naturalist and true lover of nature. That any bird can sustain an aerial course of such rapidity for 12 or 14 hours at a time, without any cessation from its exertions, must of necessity excite the astonishment of the most careless thinker, while to the inquiring mind it amply demonstrates what a marvel of strength and perfection of structure are exhibited in this wonderful bird. A casual glance at one of these Swifts will show that it is entirely formed for speed. The pointed aspect of its face and bill, with the thick lores and stiff superciliary feathers to protect the eye from the rush of air, its broad body, gradually tapering from the rump to the acute tip of the tail, give it the form of a feathered *projectile* constructed to acquire immense velocity, which, in truth, its rigid sickle-shaped wings, with their specially lengthened metacarpal bones imparting so much power to the downward stroke, cannot fail to give it. It is this peculiar outward form which imparts to it a so much higher power of speed than exists in other Swifts, such as the next species, for the structure of the sternum is not so very much superior to that of the Alpine Swift. Dr. Sclater writes, in explanation of the drawing of the sternum of this Spine-tail which is contained in the P. Z. S. 1865, that it is broader in proportion and less elongated than in *Cypselus*, and that the anterior point or apex of the keel is not carried so far forward. Apparently these slight differences would not give the Spine-tail the superiority over the ordinary Swift which it possesses were it not for its admirable external shape and greater length of metacarpus.

This Spine-tail haunts the vicinity of rocky precipices and steep hill-sides, dividing its time between careering round them and up and down adjacent valleys and sweeping over the surrounding country, especially where there exist open tracts, in search of food. When hawking in a large flock its flight is not unlike that of the Alpine Swift; but it is varied by vast circles and detours made with astonishing swiftness, as if merely for exercise, returning in a moment to its place in the flock. It is not in this manner, however, that its great powers of flight are put forth; it is in returning at nights from its day's labours to its far-distant roosting-place that these are brought out, and then its flight is as swift as the momentary rush on its quarry of the Peregrine Falcon. I have experienced this on more than one occasion in the Ceylon hills, where a whiz just over my head, like that of a bullet, has brought my attention to the onward course of one of these birds, which the next moment had disappeared far away in the gloom of the tropical evening. Mr. Carter writes, concerning a flock that he fired at, "I should not like to say how many I missed; but some idea of their rate of speed may be formed when I say that in seeing one coming towards me and turning sharp round, by the time I sighted it it was too far . . . . The two I got I killed passing over me, making great allowance and firing far in front. One, although quite dead when I came up to it, had managed to clutch a stone, which remained tight in its claws." Mr. Davison observed that they hawked very high in the air, betraying their almost invisible presence by a sharp clear whistle. At nights they were found, in company with other Swifts, about ponds or tanks. Concerning the roosting of this Swift, which is one of the most interesting points in its economy, very little seems to be known. Its spinous tail is evidently a provision of nature to afford it support against the rock to which it clings at night. It most probably, as suggested by Jerdon, has some fixed roosting-places, to which large flocks resort from immense distances, arriving no doubt at a late hour, and thus preventing the possibility of their haunt being discovered from observations of the birds on their way thither. He observed that they flew towards the coast, and on one occasion witnessed an enormous flock passing him on their way towards the sea some time after sunset, although there was no situation on the west coast where they could have roosted; consequently the idea suggests itself that they make for the sea-shore and then travel along it to their nightly rendezvous.

Layard was informed by the natives that this species nested in rhododendron-trees, which, it is scarcely necessary to remark, is an erroneous idea. It breeds, as its near ally the White-necked Spine-tail, in lofty cliffs. Mr. Bligh informs me that they yearly resort to some inaccessible precipices in the Haputale ranges for the purpose of breeding, but he has been unable to find their nests or procure their eggs.

Genus CYPSELUS.

Bill slightly stouter and more curved from the base than in *Chætura*. Wings equally long, the metacarpus shorter in proportion; the 2nd quill equal to, or longer than, the first. Tail variable in length, emarginate or deeply forked. Tarsus very short, feathered; all four toes directed forward, but the two inner reversible, shorter than in the last.

CYPSELUS MELBA.

(THE ALPINE SWIFT.)

Hirundo melba, Linn. Syst. Nat. i. p. 345 (1766).

Hirundo alpina, Scop. Ann. i. Hist. Nat. p. 166 (1769).

Cypselus melba, Illig. Prod. Syst. Mamm. et Av. p. 230 (1811); Gould, B. of Europe, pl. 53 (1837); Blyth, Cat. B. Mus. A. S. B. no. 421. p. 85 (1849); Kelaart, Prodromus, Cat. p. 117 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 167; Jerdon, B. of Ind. i. p. 175 (1862); Tristram, P. Z. S. 1864, p. 431; Sclater, P. Z. S. 1865, p. 598; Holdsworth, P. Z. S. 1872, p. 419; Severtzoff, Faun. Turkestan, pp. 67, 145 (1873); Dresser, B. of Europe, pt. 31 (1874); Butler & Hume, Str. Feath. 1875, p. 453.

Le Grand Martinet à ventre blanc, Mont. Hist. Ois. vii. p. 316 (1783).

Le Martinet à gorge blanche, Levaillant, Ois. d'Afr. (1806).

Andorinhão gaivão, Portuguese; *Avion*, Spanish; *Alpensegler*, German.

The Common Large Swift, Kelaart, Prodromus.

Wæhælaniya, Sinhalese.

Adult male and female. Length 8·5 inches; wing 8·0 to 8·25; tail 3·0 to 3·5 tarsus 0·55; middle toe 0·35, its claw (straight) 0·32 to 0·35; bill to gape 0·85 to 0·9.

The tail is slightly forked in this species.

Obs. These measurements are taken from three Ceylon examples, and are below those of birds from Europe and Africa, some of which, from Switzerland, range as high as 8·7 in the wing. Possibly these Ceylonese specimens were bred in the island, and would almost of necessity be smaller than those from cold countries.

Iris brown; bill blackish, darkest at the tip; feet livid brown, claws black.

Head, all the upper surface with the wings and tail glossy earth-brown, passing over the chest and down the flanks to the under tail-coverts; on the wings and tail a strong brownish-green lustre is often present; feathers of the back, rump, and upper tail-coverts with the shafts perceptibly darker than the web; quills and rectrices darker than the back; lores black, surmounted by a thin whitish line; chin, throat, breast, and abdomen white; the feathers above and below the brown pectoral band and those of the flanks more or less tipped with the same; thighs and tarsal feathers concolorous with the flanks; under wing-coverts dark brown, some of the feathers tipped with white; edge of the wing more or less narrowly margined with white.

Young. Birds of the year have the feathers of the head, sides of the neck, and all the upper surface with fine whitish terminal margins, external edge of wing-lining with conspicuous white edgings, the white throat-patch more extensive, reducing the extent of the brown pectoral band; under tail-coverts tipped with white.

Distribution.—The Alpine Swift takes up its quarters almost exclusively in the upper regions of the Kandyan Province; but, being a bird of such immense powers of flight, it wanders with ease, in the course of a day's hawking, over all parts of the island. Hence Layard observed it at Dambulla and Ratnapura, and I

have seen it at Topare tank. Mr. Holdsworth records it as frequenting Nuwara Elliya throughout the cool season, and Mr. Bligh has noticed it both there and in Haputale at various times of the year. In May I found it in great numbers congregated about the high cliffs of Ragalla, which rises above the Elephant Plains, where, as Mr. E. Watson informs me, it is often to be seen. It probably frequents the Gongalla range, in the southern coffee-district, in common with the last species.

Ceylon appears to be the most southerly point of this Swift's range in Asia. It is found all through India, more particularly in the Ghâts, Nilghiris, and Cashmere hills, from which it extends through Western Asia to Europe, which may be most properly styled its head-quarters, and where it is well known in the Alps, Pyrenees, and other groups of mountains. Through Africa it wanders as far as Cape Colony, whence it is recorded by Layard, Andersson, Ayres, Shelley, and others, but in the tropical region south of the Atlas it has not as yet been observed; in the northern parts of the continent it is common, wandering over Egypt and Algeria in the summer, and the same may be said of the northern sea-board of the Mediterranean. Mr. G. C. Taylor records it as plentiful in the Crimea and at Constantinople; Mr. Danford noticed it as a summer visitant to parts of Asia Minor, and Severtzoff found it breeding in scattered localities in Central Asia (Turkestan). To parts of India it is a cold-weather visitant; at Mount Aboo it arrives, according to Captain Butler, in large numbers about the beginning of September, and remains throughout the season. It has not been found to the eastward of the Bay of Bengal, being replaced in Burmah and Tenasserim by *C. pacificus*.

Habits.—This splendid Swift, which, next to the larger species of the foregoing genus, is the swiftest bird in existence, loves to haunt the vicinity of great mountain declivities, towering precipices, ravines, or great river-gorges, about which it dashes at tremendous speed, either in search of its insect-prey, or, as would appear to an eye-witness, from some normal habit of exercising its marvellous muscular power. It is most active, like other Swifts, before rain, when the atmosphere teems with life, or on still evenings, when it may be seen varying its headlong flight with extensive curves and vast swoops, from which it will rise with renewed swiftness and redoubled beatings of its long, sickle-shaped wings. It hawks late in the evening, and it is generally nearly dusk before it directs its course towards the far-off roosting-place which it left in the morning, and the reaching of which will perhaps add some hundreds of miles to the immense distance which it has traversed during the day. Dr. Jerdon, who, to judge by his writings, took much interest in this family, observed them in the south of India flying towards the sea-coast about sunset, and was of opinion that it was their habit to make for the seaside and then follow the coast-line, "picking up stragglers from other regions on their way to the cliffs of Gairsoppa," where he discovered that they roosted. Tickell, as quoted by the same author, noticed these Swifts assembled "of an evening near large ponds in the jungle, dashing into the water with loud screams," like the Common Swift of Europe. They assemble in very large flocks, and, as I noticed at Polanarua, suddenly appear in a locality, and, after hawking it well, as quickly disappear again. It has a shrill, tremulous cry, which has a curious sound as the bird rapidly approaches the spectator, and, instantly passing overhead, is again quickly out of hearing. It is said to roost against cliffs, clinging to the rock in an upright position, for which its powerful and much-curved claws are well adapted.

Nidification.—As regards Ceylon, little or nothing is known of this Swift's breeding. Mr. Bligh is of opinion that it nests in April and May near Nuwara Elliya and on the southern slopes of the Haputale range, and it is not impossible that some of the birds observed by me at Ragalla were breeding in the great precipice there. It does not confine itself to cliffs and rock-faces, but will nest in churches and other large buildings. Mr. Hume describes nests sent to him by Miss Cockburn from the Nilghiris as being made of "feathers firmly cemented together with saliva; but vegetable fibre of different kinds and dry grass formed part of the structure, which was a coarse felt-like mass of about 5 inches in diameter, with walls 1 inch thick; and several nests appear to have been grouped together. The eggs are four or five in number, pure white."

CYPSELUS AFFINIS.

(THE INDIAN SWIFT.)

Cypselus affinis, J. E. Gray, Ill. Ind. Zool. i. pl. 35. fig. 2 (1832); Sykes, P. Z. S. 1832, p. 83; Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. p. 235. no. 255; Blyth, Cat. B. Mus. A. S. B. p. 86 (1849); Kelaart, Prodromus, Cat. p. 117 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 167; Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 106 (1854); Jerdon, B. of Ind. i. p. 177 (1862); Sclater, Ibis, 1865, p. 235; id. P. Z. S. 1865, p. 603; Blyth, Ibis, 1866, p. 339; Holdsworth, P. Z. S. 1872, p. 419; Hume, Str. Feath. 1873, p. 166; Ball, Str. Feath. 1873, p. 370; Hume, Nests and Eggs, i. p. 85 (1873); Dresser, B. of Eur. pt. 33 (1874); Aitken, Str. Feath. 1875, p. 214.

Cypselus nipalensis, Hodgs. J. A. S. B. v. p. 780 (1836).

C. galilejensis, Antinori, Cat. Collez. di Uccelli, p. 24 (1864).

C. galilæensis, Tristram, Ibis, 1865, p. 76.

C. abyssinicus, Streubel, Isis, 1848, p. 354.

The Allied Swift, Gray; *White-rumped Swift*, Jerdon.

Ababil or *Babila*, Hind.; *Huwa bil-bil*, Natives at Saharunpore (Jerdon).

Wæhælaniya, *Læniya*, Sinhalese.

Adult male and female. Length 5·1 to 5·5 inches; wing 5·1 to 5·3; tail 1·8; tarsus 0·4; mid toe and claw 0·5; bill to gape 0·65 to 0·7.

In this species the tail is short, slightly forked, but the feathers not pointed.

Iris deep brown; bill black; feet vinous-brown, claws black.

Head, hind neck, wings, and tail blackish brown, with a slight greenish lustre, and the forehead paler than the crown: back and scapulars glossy green-black, blending into the hue of the hind neck; primaries pale on the inner webs, the tertials and the feathers along the metacarpal joint with fine light edges; rump and its sides, with the chin and centre of the throat, white, some of the feathers of the former region generally with dark shafts; under surface glossy black, paler on the under tail-coverts; under wing brownish black.

Young. Immature birds have the feathers of the under wing-coverts margined with whitish, and the rump more lineated than in the adult; the breast and lower parts are likewise more or less finely edged with whitish.

Obs. This Swift varies considerably in size in different portions of its habitat. In India Mr. Hume has found it varying in the wing from 4·8 to 5·5 inches; and Dr. Finsch gives the wing of specimens from the Blue Nile as high as 5·6 inches; he likewise remarks that a more or less visible superciliary stripe is occasionally visible. I have found the amount of white on the throat to be variable in some examples; it does not quite extend to the chin; probably such are mature birds.

Distribution.—The common Indian Swift is not migratory to Ceylon, as was supposed by Layard, but is merely a wanderer throughout the low country, its movements appearing to be regulated by the weather and monsoon winds. In the south-west of the island I have noticed it at the seaside only during the first three months of the year, although I have seen it in the hilly parts of the interior during the S.W. monsoon, at which season Mr. Parker, of the Ceylon Public Works Department, has observed it at Puttalam. In the north-east I have seen it at both seasons of the year, but am of opinion that it is no more than a straggler over that flat region, traversing it in the course of a day's wandering from its head-quarters in the hills. In the Kandyan Province it is a common bird and a permanent resident there. It appears to prefer the dry climate of Uva to other parts, although I have noticed it in most of the coffee-districts. It is sometimes

met with about Nuwara Elliya and on the Horton Plains, but in all probability does not roost in such high regions.

It is a bird of very extensive range, for besides inhabiting the whole of India and Western Asia as far as Palestine, where it is the *C. galilæensis* of Antinori, it extends through Africa to the extreme south. Although found throughout India from the south to the Himalayas, Jerdon remarks that large tracts of country may be traversed at times without seeing a single individual, and Mr. Hume has likewise found it to be very local. In many parts of Sindh he met with it commonly, but throughout Upper Sindh to Sehwan he did not see it. At Mount Aboo and the plains of the surrounding country it is common, breeding in the celebrated Dilwarra temples. It is rare in the Deccan; and Col. Sykes remarks that though found in all districts in India, it is often confined to a small tract in the neighbourhood of some fine large pagodas and other buildings. In the central regions of Nepal it is said by Hodgson to remain throughout the year. In Palestine Canon Tristram records that it is a permanent resident in the Jordan valley, while every other species of its genus is migratory there. In the portions of Africa which are inhabited by it it is likewise non-migratory. With regard to this peculiarity in its economy, it is singular that the same is true of its representative on the eastern side of the Bay of Bengal, the *Cypselus subfurcatus* of Blyth, which Mr. Swinhoe recorded as "resident on the Chinese coast" as far north as Amoy.

Habits.—In the mountains of Ceylon this stout little Swift is usually seen coursing over coffee-estates, steep patnas, or the so-called "Plains" in the upper ranges, while in the low country it affects every variety of open situation, particularly on sultry rainy evenings, when the damp tropical air is teeming with an abundance of insect-food. It congregates in large flocks, and hawks about with a rapid powerful flight, careering round and round at a great height, and then suddenly descending, will fly as low as the Common Swallow, picking up its evening meal right and left with no apparent exertion. In the hills it consorts with the Swiftlet, and may often be seen late in the evening flying with that species in some given direction on its way to a distant roosting-place, probably some inaccessible cliff where it has been bred. It is not usually a noisy bird, its note being a weak scream, resembling that of the European Swift, but not so soft in tone, and which Blyth styled a "shivering" cry. In the breeding-season, however, its cries are incessant; packing in small troops like the common Swift of Europe, it dashes round the spot where its nests are swarming with young, alighting for an instant to convey to the hungry mouths the food which it carries in its bill, and then sweeping off in a body, separates in search of a fresh store or continues its circular peregrinations. Jerdon, who remarks that its flight is fluttering and irregular in the morning and evening, writes that "small parties at these times may be seen flying close together, rather high up in the air and slowly, with much fluttering of the wings and a good deal of twittering talk; and after a short period of this intercourse all of a sudden they separate at once and take a rapid downward plunge, again to unite after a longer or shorter interval." They may occasionally be seen flying beneath culverts and road-bridges like a Swallow, evidently feeding on the insects which congregate about the water in such places. Mr. Blyth, it may be remarked, has stated that he has seen this Swift rise from off the ground.

Nidification.—This species breeds either in large colonies or in company with a few of its fellows, and rears its young at various periods between the months of March and July. It builds in the verandahs of outhouses, beneath bridges and culverts, under overhanging rocks, or in caves, in all of which situations I have known its nest to be found. Layard found them breeding at Dambulla in April about the rocks there, and at Tangalla beneath a bridge. I met with a large colony nesting in March in a salt-store at Kirinde, and another in May under the celebrated wooden bridge at Wellemade in Uva. In the month of April several pairs used to breed annually in a small seaside cave near Trincomalie. Mr. Holdsworth found it nesting "under the rocks overhanging the entrance to the famous temple at Dambulla." The nest is constructed of feathers, straw, grass, and at times pieces of rag, wool, twine, or any miscellaneous material which the bird can find and which will assort well with the rest of the structure. The whole mass is firmly cemented together with the saliva of the bird, and is shaped in accordance with the situation in which it is built, which likewise determines the position of the aperture. The interior is spacious, and sometimes several nests are fastened together. Nests which I have seen in caves or beneath bridges

have had the entrance at the top, and others fixed under tiles have been very long structures with the opening at the end. My correspondent, Mr. Parker, writes me of a pair which took possession of a Red-bellied Swallow's nest under a road-bridge near Kurunegala. To get possession of the eggs a hole had to be made in the side of the nest, which the bird used afterwards as an outlet. On a second visit a piece of the side came out, which the bird clumsily repaired the third year with feathers and leaves, making up a piece of patchwork which reminded one of a "hole in a window-pane stuffed with a piece of cloth!" The number of eggs is generally three; they are long ovals in shape, smooth in texture, and pure white in colour; they vary from 0·8 to 1·0 inch in length by 0·55 to 0·65 inch in breadth.

From what has been written of its nidification in India, it appears that there its nest varies in character, as in Ceylon, according to its situation. Mr. Aitken, writing of its breeding at Berar, remarks that when the nest is attached to the roof of a building and not supported in any way, the straws of which it is composed are so firmly agglutinated that it tears like a piece of matting.

CYPSELUS BATASSIENSIS.

(THE PALM-SWIFT.)

Cypselus batassiensis, Gray, Griff. An. Kingd. ii. p. 60 (1829); Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 128 (1854); Jerdon, B. of Ind. i. p. 180; Blyth, Ibis, 1866, p. 340; Sclater, P. Z. S. 1865, p. 602; Holdsworth, P. Z. S. 1872, p. 420.

Cypselus balasiensis, Blyth, Cat. B. Mus. A. S. B. p. 86 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 167.

Cypselus balisiensis, Kelaart, Prodromus, Cat. p. 117.

Cypselus palmarum, Gray & Hardwicke, Ill. Ind. Zool. i. pl. 35 (1832); Hume, Nests and Eggs, i. p. 87; Ball, Str. Feath. 1874, p. 384.

Putta-deuli and *Tari ababil*, Hind.; *Tal-chatta*, Bengal, lit. "Palm-Swallow;" *Batassia*, Bengal (Jerdon); *Chamchiki*, Beng., a name also applied to Bats (Blyth).

Wæhælaniya, Sinhalese.

Adult male and female. Length 5·1 to 5·3 inches; wing 4·3 to 4·7; tail 2·4 to 2·8, outer feather 1·0 longer than the middle; tarsus 0·4; middle toe and claw 0·32; bill to gape 0·5. The wings reach 0·5 beyond tail, which is deeply forked, with the feathers pointed at the tips.

Iris sepia-brown; bill black; legs and feet vinous-brown; claws blackish.

Above glossy ash-brown, darkest on the head and tail; the lower back and rump paler than the interscapular region and with dark shafts to the feathers; quills blackish brown, with the internal margins slightly paler than the rest. Bases of the loral feathers white; beneath mouse-grey; the under tail-coverts with dark shafts, and the flanks darker than the breast.

Young. On leaving the nest the young bird is clothed like the adult, but the upper surface is not so glossy.

Distribution.—The little Palm-Swift is the most numerous of its genus in Ceylon, and is found throughout the entire low country and sub-hill region. It is seen now and then in the Kandy district; but is not a permanent resident there, and on the Uva side of the Central Province it ascends from the plains in fine weather to a considerable altitude, Mr. Bligh informing me that he has seen it in Haputale as high as 4000 feet. It is a common bird in the south and west of the island, and more numerous on the sea-board than in the interior. In the palmyra-districts, on the northern coasts, it is very abundant, and is the only Swift, as far as I can ascertain, which commonly affects the Jaffna peninsula and adjacent islands.

As regards the Palm-Swift's distribution in India, Jerdon informs us that it is abundant in all districts where palmyra- and cocoanut-palms are found, and that it is common on the Malabar coast, the Carnatic, the northern Circars, and Bengal, but rare in the central tableland and North-west Provinces. In Chota Nagpur Mr. Ball says it is found in abundance where its favourite trees are common, and so local is it that he has observed a small colony settled in a single tree, where, perhaps, for many miles around not another tree or Swift could be found. It is said to extend into Assam and Burmah; but this can only be as a straggler, as it is not recorded in 'Stray Feathers' from either Pegu or Tenasserim; it is replaced in these provinces by *Cypselus infumatus*, the Sooty, or, as called by some, the "Palm Roof-Swift." It has not as yet been procured in Sindh.

Habits.—The localities preferred by this Swift are fields and open lands in the vicinity of cocoanut- and palmyra-groves. In the northern parts of the island it is seen much about the sea-shore, which is, in many places, completely lined with the widely spread *Borassus* palm, its favourite tree all over India; indeed Jerdon remarks that it is seldom found at any distance from where this palm grows. This, however, is not its habit in Ceylon; for it abounds in many parts of the Western Province, where the tree is unknown, but where its place is supplied by the cocoanut, and particularly the areca-palm, around which latter it careers

in little flocks with lively screams in just the same manner. These remain about the place of their birth throughout life, roosting in the trees which contain the nests in which they were reared, and to which they return early in the evening, flying up to the fronds and again darting off in search of their evening meal. It associates in parties of considerable numbers, and may often be seen, in company with the Swiftlet, hawking at evening time over the paddy-fields in the Western Province. Its flight is swift and regular at times and fluttering at others, particularly when hawking in a flock; it flies late at nights, and, as Dr. Jerdon remarks, it is not uncommon to see Bats and these Swifts hawking together at dusk, a circumstance which perhaps has given rise to the belief that it is nocturnal in its habits, and is also doubtless the origin of its Bengal appellation "*Chamchiki*." I have seen it flying rather leisurely about, taking winged termites, at sunset. Its note, which it constantly utters, is likened by Blyth to the sound *titeeya*, which is a very correct rendering of it, although there is a pretty shrillness in the cry that cannot be well expressed in words. Dr. Hamilton considered this bird to be nocturnal in Bengal, appearing at sunset and going to rest at sunrise! It certainly hawks very late; but it is difficult to understand what became of those that were seen at sunrise, and whose disappearance must have given rise to this strange belief.

Nidification.—This species breeds from October until April, probably rearing two broods in the season, as I have found eggs and young of the same colony during both these months. Although it invariably nests in the palmyra-palm wherever these trees are to be found, I am of opinion that it takes to the areca in the south of the island, as I have seen them thronging around these trees at Galle during the breeding-season. It very often selects an isolated palmyra, and sometimes one situated in a most public spot, to breed in—to wit, the solitary tree which stands on the shore in front of Fort Frederick at Trincomalie, and in which there is always a little colony to be found. The nest is built on the under surface of the hanging fronds, which droop round the head of the trunk beneath the cluster of more vital and horizontal ones; it is attached principally to the ribs of the leaf, and situated high up where these lie at a convenient distance from one another. If, however, it is placed low down, near the tip, it is firmly fixed to the hollow portions as well as the ribs. In shape it resembles a little open pocket, with a shallow interior of about 1 inch in depth and 1⅜ in width; the back part, adjoining the leaf, which is thin, is continued for some distance up, affording an additional support, and often a partial foundation, for another nest built immediately above it. The materials consist of "wild cotton," the down from the pod of the cotton-tree, mixed with feathers which are placed in regular layers round the front and firmly incorporated with the cotton, which is agglutinated with the saliva of the bird. Sundevall, remarks Jerdon, shot these birds with their mouths slimy and filled with the down of some syngenesious plant which they appeared to catch during their flight. Mr. Hume finds the nests in India to be constructed of the fine down of the *Argemone mexicana* and similar plants. The eggs are two or three in number, much elongated and smooth in texture, pure white, and the shell very thin; they measure from 0·65 to 0·7 inch in length, and from 0·43 to 0·46 inch in breadth. The young, when able to use their feet, cling to the leaf above the nest, supporting themselves in an upright position; the old birds, when feeding them or entering their nest, alight at the bottom of the palm-leaf and run nimbly up the ribs.

Genus COLLOCALIA.

Bill smaller and more hooked than in *Cypselus*. Wings with the 1st quill considerably shorter than the 2nd. Tail slightly forked, and the tips of the feathers rounded. Tarsi and feet very small and feeble; tarsus naked, the hind toe directed backward and only partially reversible.

COLLOCALIA FRANCICA.

(THE INDIAN SWIFTLET.)

Collocalia francica, Gm. Syst. Nat. i. p. 1017. no. 15 (1788); Walden, Ibis, 1874, p. 132.

Hirundo brevirostris, M'Clelland, P. Z. S. 1839, p. 155.

Hirundo unicolor, Jerdon, Madr. Journ. Sc. xi. p. 238 (1840).

Collocalia nidifica, G. R. Gray, Gen. Birds, i. p. 55. no. 1 (1844); Blyth, Cat. B. Mus. A. S. B. p. 86 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 98 (1854); Bernestein, J. f. O. 1859, p. 118; Jerd. B. of Ind. i. p. 182 (1862); Legge, Ibis, 1874, p. 13.

Collocalia brevirostris, Kelaart, Prodromus, Cat. p. 118; Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 168.

Collocalia fuciphaga, Holdsworth, P. Z. S. 1872, p. 420.

Collocalia unicolor, Bourdillon and Hume, Str. Feath. 1876, pp. 374, 375.

Esculent Swallow of Latham and Stephens; *Indian Edible-nest Swiftlet.*

Wæhalaniya, Sinhalese.

Adult male and female. Length 4·5 to 4·8 inches; wing 4·1 to 4·6, reaching 0·8 to 1·1 beyond the tail; tail 1·9 to 2·1; tarsus 0·4; middle toe and claw about 0·4; bill to gape 0·4.

Iris brown; bill black, vinous-brown at base; legs and feet dusky fleshy reddish, in some fleshy brown.

Above uniform dark smoke-brown, with a green lustre on the back, wings, and tail; primaries and tail deep glossy brown; the feathers of the rump albescent at the margins near the base, the light portions concealed beneath the overlying feathers; lores whitish at the base and tipped black; beneath glossy mouse-grey, palest on the neck and chest; the under tail-coverts with a slightly greenish gloss.

Young. The nestling is plumaged like the adult as soon as fledged; the tips of the quills finely margined with albescent.

The skin of the unfeathered chick is dark brown; and the head becomes quite feathered before the body commences, the scapulars following next.

Obs. No little confusion has existed in the synonymy of this and the Javan Swiftlet, *C. fuciphaga* of Thunberg; and ornithologists are therefore much indebted to Lord Tweeddale for his note on these species in the 'Ibis,' 1874, in which Indian, Ceylonese, and Andaman specimens of the species are shown to be identical with those from Mauritius and Seychelles. His lordship writes me that a specimen which I have lately forwarded him for examination is identical with birds from the Nilghiris, Darjiling, Andamans, and Malacca. The peculiarity of this species is that the tips of the concealed basal parts of the webs of the dorsal feathers are albescent, which increases in paleness towards the rump, showing in some specimens on the surface of the plumage and imparting a light appearance to that region. I regret that I did not collect more examples of this Swiftlet while in Ceylon: in the several that I have examined this latter degree of paleness has not been perceptible on the surface of the rump-plumage, although the basal portions of the feathers exhibit the above-mentioned character. Layard, in his correspondence with Blyth on the subject of this Swiftlet's nesting, writes of it as *C. nidifica*, but styled it *C. brevirostris* in his published notes, an older title bestowed by M'Clelland on a specimen from Assam, but which Mr. Hume is of opinion in reality applies to *Cypselus infumatus*, Sclater. Gmelin's title has not yet come into use in the pages

of 'Stray Feathers,' as Mr. Hume still applies Jerdon's name of *C. unicolor* (bestowed in the Madras Journal on the first specimens he received from the Nilghiris) to examples from Southern and Northern India.

C. fuciphaga from the Andamans as well as Java is a much smaller bird than *C. francica.* Total length about 3·5 inches; wing 3·8, reaching 1·5 beyond tail; tail 1·5.

Above glossy black-green, with a very strong lustre on rump and upper tail-coverts and tail; throat and sides of fore neck dark brownish grey, chest-feathers edged with whitish; breast and abdomen white, the feathers with mesial brown lines; under tail-coverts concolorous with the back, the shorter feathers broadly margined with white.

Distribution.—The little Swiftlet of Ceylon is spread over the whole island, taking up its quarters in the low country near the many isolated rocky hills which abound therein, and wandering thence over the surrounding districts, while in the Kandyan Province, full of precipices and caves, it everywhere finds a home. There are consequently many parts of the low-lying forest districts where it may always be found, such as the rocky ranges in the Eastern Province, the hilly Pattus and Koralcs in the south-west, from which it strays to the neighbourhood of Galle, the vicinity of the curious rock-ridges stretching from Kurunegala to Dambulla and northwards to the isolated and singular mountain of Rittagalla, whence it overruns all the Vanni to the extreme north; in these localities, as also about sundry rocks on the north-east coast to the south of Tirei, the precipices of Yakhahatua near Avisawella, and other crags in the Raygam Korale, I have invariably noticed the Swiftlet. It is occasionally seen, on fine mornings, about the cinnamon-gardens of Colombo, but not so often as round the southern port. It is abundant in the higher parts of Uva, round Nuwara Elliya and Hakgala, and similar spots in the main range.

This species is found throughout the south of the Indian peninsula, and is said to be more abundant on the Travancore and Nilghiri hills than in the low country. In the north of India it is found in Sikhim and in the neighbourhood of Darjiling. Southward it extends into Malacca and to the Andamans, where a nearly allied species, *C. spodiopygia,* Peale, with a paler rump, is found. In the opposite direction it reappears in the Mauritius and Seychelle group of islands.

Habits.—This Swift generally affects the crags and rocky hills in which it has been bred, wandering great distances during the day over the surrounding country. At early morn, when sallying out from its roosting-places, the caves of its birth, it flies about the vicinity with a rather tardy, uncertain flight, and then starts off for distant questing-grounds, when numbers may be met with, all making for the same direction, whence they doubtless spread outwards in search of food. In the afternoon they return in great numbers and pack into a large flock, dashing about their native rocks in close company, uttering their low, hissing cries. They commonly associate with the Palm-Swift, and when questing with these on open ground, such as the "cinnamon," fly very low and may easily be shot. They can always be recognized from *C. batassiensis,* on the wing, by the short tail and the absence of the well-known note of this latter species. I have noticed them hawking about the bunds of large tanks, flying close to the water and keeping up their evening meal until quite dark. Jerdon mentions them returning to the caves in Pigeon Island, off Honore, as late as 9 P.M., and comments on the vast distance they must have flown to arrive at their roosting-place three hours after dark! Their powers of flight are certainly very great, their progress being much more rapid than that of the Palm-Swift. The food of this species consists of gnats, mosquitos, and other small flies. It appears, like other Swifts, to be constantly in the act of catching its food; even late at night, when sitting on a lofty cliff overlooking one of the magnificent prospects of the splendid province of Uva, I have watched them picking off insects in their rapid progress homeward.

Nidification.—The breeding-season of this little Swiftlet in Ceylon lasts from March until June. It nests in large colonies in various caves in the hills and mountains of the central and southern parts of the island. Many of these are known from seeing the birds haunt the vicinity of certain precipitous hills; but few have been visited and examined, on account of the general inaccessibility of these resorts. Among those which are known are:—two situated on the rocky hills of Diagallagoolawa, near Pittegalla, on the banks of the Bentota river, and which are referred to in the extract given below from Layard's notes; several occupied by large and small colonies on the Dambetenne and Piteratmalie estates on the south face of the Haputale range; one on Pedrotallagalla, spoken of by Kelaart; and another which I was informed of in a hill called Maha-ellagala, near

the "Haycock" mountain, as also another in the Nitre-cave district. Besides these there are, I believe, colonies in the "Friars-Hood" or some of the surrounding rock-hills and in Rittagalla, the above-mentioned mountain situated between the Central and Trincomalie roads. The celebrated cave in the Haputale range, and the only one which I have had the good fortune to visit, is situated in a bold peak standing out above and towering over the Dambetenne and adjoining estates, which form one of the finest sweeps of coffee-ground in Ceylon. On a sultry day in May 1876, my friend Mr. Bligh and myself set out from Catton bungalow to see the Swifts' cave. A long tramp round the adjacent spur brought us to the gorge in which lies the fine estate of Mousakella, up which we toiled, gradually winding our way up the zigzag paths, and at last reached the inviting shade of the tall forest crowning the top of the ridge. Here our journey was enlivened by the notes of the usual denizens of these belts of fine jungle; and as we trudged along, listening to the clear, strong whistle of the Grey-headed Flycatcher, the churr of the handsome Trogon, and the twittering of the brilliant "Sultan-bird" (*Pericrocotus flammeus*), we congratulated ourselves that we had reached the highest point of our journey (6000 feet), and that we had but a short and immediate descent to our destination. Another half-mile and we had passed over the ridge and came into sudden view of the glorious prospect beneath, such a one as only can be witnessed in the higher ranges of the beautiful Central Province. Before us lay a magnificent amphitheatre, the top of it a dark sweep of forest, and the middle a splendid basin of coffee, consisting of the Dambetenne and Piteratmalie estates, in luxuriant growth, between which and ourselves a narrow ravine ran down from the range on our right and suddenly opened out into an abysmal gorge, the wooded slopes of which stretched up to the foot of the coffee. In these woods Mr. Bligh, some years previous, had discovered the handsome Whistling Thrush (*Arrenga blighi*). At a point where the great gorge suddenly commenced, by a sheer precipice dropping down about 1000 feet into the lower estate, stood the fine bungalow occupied by the gentleman, Mr. Imray, who was to be our kind host for the night; and at the back of this, at the top of a rich slope of coffee, towered up a rocky buttress, in which the Swiftlets of Haputale propagate their species. In this precipice a vast boulder, about 70 feet in height and 50 in breadth, has at some period slipped away from the face of the mountain, and leans against it at an angle of about 30°, forming a lofty narrow cavern. Here about 300 pairs of birds have their nests built against the inner side of the boulder, which is convex and corresponds with the concave face of the main mass. There are no nests on this latter, down which there is doubtless a considerable amount of drainage; and the instinct of the little birds is here wonderfully displayed in rejecting the wet side of the cavern, which would seriously impair the stability of their gelatinous nests. These are placed in tiers, one above the other, about 15 feet from the guano at the bottom of the cave; in places three or four were joined together, the back part of the under nest being prolonged up to the bottom of the one above it. The little structures were by no means edible, being constructed of moss and fine tendrils, arranged in layers and cemented with the inspissated saliva of the bird, the back part attaching the nest to the rock, as well as the interior of the cup, being, however, entirely of this material. I have seen one or two nests from Pittegalla almost wholly made of this substance; but even these were mixed, to a certain extent, with foreign or vegetable material. The interior of these Dambetenne nests was in most cases oval, the longest diameter, which varied from 2 to $2\frac{1}{2}$ inches, being parallel to the rock. In depth the egg-cup was, on the average, about 1 inch. At the date of my visit, the 22nd May, nearly all the nests contained young, two being the average number. A series of eggs procured at another time, and which I have examined, were of various shapes, long ovals being the predominant; they are pure white, and varied from 0·81 to 0·83 inch in length by 0·51 to 0·54 in breadth. It is noteworthy that the partially-fledged young which were procured for me on this occasion, and which I kept for the night, scrambled out on to the exterior of the nests and slept in an upright position, with the bill pointed straight up. This is evidently the normal mode of roosting resorted to by the species.

The interior of this cave, with its numbers of active tenants, presented a singular appearance. The bottom was filled with a vast deposit of liquid guano, reaching, I was informed, to a depth of 30 feet, and composed of droppings, old nests, and dead young fallen from above, the whole mingled into a loathsome mass with the water lodged in the crevice, and causing an awful stench, which would have been intolerable for a moment even had not the hundreds of frightened little birds, as they screamed and whirred in and out of the gloomy cave with a hum like a storm in a ship's rigging, powerfully excited my interest and induced a prolonged examination of the colony. This guano-deposit is a source of considerable profit to the estate, the hospitable

manager of which informed us that he had manured 100 acres of coffee with it during that season. Besides this colony, there are two other smaller offshoots on the adjoining estate, in one of which, Mr. Bligh tells me, the birds have to pass through a cloud of spray in order to gain access to their nests.

Concerning the large breeding-station on the Bentota river, Mr. Layard writes, in the 'Annals and Magazine of Natural History' for 1853, xii. p. 168, as follows :—" Having fully described my acquaintance with these birds in a letter to my friend Mr. Blyth, I cannot do better than copy what I then wrote :—'The cave is situated at a place called Havissay, about thirty-five miles from the sea and twenty from the river, and about 500 feet up a fine wood-clad hill called Diagallagoolawa or Hoonoomooloocota. Its dimensions are as follows—length between 50 and 60 feet, about 25 broad and 20 high. It is a mass of limestone rock, which has cracked off the hill-side and slipped down on to some boulders below its original position, forming a hollow triangle. There are three entrances to the cave, one at each end, and one very small in the centre. The floor consists of large boulders, covered, to the depth of 2 or 3 inches, with the droppings of the birds, old and young, and the bits of grass they bring in to fabricate their nests. The only light which penetrates the cavern from the entrances above mentioned is very dim; when my eyes, however, got accustomed to the light, I could see many hundreds of nests glued to the side of the fallen rock, but none to the other side, or hill itself. This I attribute to the fact of the face of the main rock being evidently subject to the influence of the weather, and perhaps even to the heavy dews off the trees; but for this the side in question would have been far more convenient for the birds to have built on, as it sloped gently outward, whereas the other was much overhung and caused the birds to build their nests of an awkward shape, besides taking up more substance. I was at the spot a few days before Christmas, and fancy that must be about the time to see the nests in perfection. This is corroborated by the fact of my finding young birds in all the nests taken by me, and by what the old Chinaman said, that the 'take' came on in October. I find that they have three different qualities of nests, and send two for your inspection; the best is very clean, white as snow and thin, and is also very expensive. The most inferior are composed of dry grasses, hair, &c.; but I could not detect any thing like the bloody secretion as described (though only under peculiar circumstances of exhaustion) by Mr. Barbe, even in a fresh nest. I was in the cave late (after 5 P.M.) in the evening of a day which threatened rain; but the old birds were still flying round the summit of the mountain at a vast altitude, occasionally dashing down into the cave with food for their nestlings.'"

Genus DENDROCHELIDON.

Bill much as in *Collocalia*, but smaller, if any thing, and much hooked at the tip. Wings with the 1st quill the longest. Tail very long and deeply forked, the lateral feathers much attenuated. Tarsus very short, much less than the middle toe; three anterior toes subequal; hallux long, directed backwards, and not reversible.

DENDROCHELIDON CORONATUS.

(THE INDIAN CRESTED SWIFT.)

Hirundo coronatus, Tickell, J. A. S. ii. p. 580, xv. p. 21 (1833).

Macropteryx coronatus, Blyth, Cat. B. Mus. A. S. B. p. 87 (1849); Kelaart, Prodromus, Cat. p. 117 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 167.

Macropteryx longipennis (Swainson), Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. p. 236.

Dendrochelidon schisticolor, Bonap. Consp. Av. i. p. 66 (1850).

Dendrochelidon coronatus, Gould, B. of Asia, pt. xi. (1859); Jerdon, B. of Ind. i. p. 185 (1862); Holdsworth, P. Z. S. 1872, p. 420; Hume, Nests and Eggs, i. p. 92 (1873); Legge, Ibis, 1874, p. 13; Ball, Str. Feath. 1874, p. 384; Oates, Str. Feath. 1875, p. 45; Fairbank, ibid. 1877, p. 393.

Adult male and female. Length 9·3 to 9·75 inches; wing 6·1 to 6·3; tail 5·3 to 5·7 (outer feathers 3·25 to 3·6 longer than the middle); tarsus 0·35; middle toe and claw 0·65; bill to gape 0·75. Female slightly the larger.

Iris deep brown; bill black, inside of mouth slate; legs and feet vinous-brown, claws blackish.

Eye very large for the size of the bird. Coronal feathers elongated and capable of being erected.

Adult male. Head, back and sides of neck, back, scapulars, and rump bluish ashy, palest on the back, and with a greenish gloss on the head and upper tail-coverts, continued in some birds to the back; wing-coverts deep though obscure lustrous green; quills and tail obscure metallic green, with a steel-bluish lustre about the tips of the shorter primaries; terminal portions of the tertials greyish.

Lores black, surmounted by a thin white supercilium; a blackish orbital circle; chin, cheeks, and ear-coverts glossy chestnut, palest on the chin; throat and chest ashy, blending into the deeper hue of the sides of the neck and passing down the flanks, the lower parts of which are concolorous with the rump; lower breast, abdomen, and under tail-coverts white, blending into the surrounding grey hue; under wing-coverts dusky bluish ashy.

Female. Wants the rufous chin and cheeks of the male, the face and behind the eye being black, as are the lores; beneath the cheeks a whitish line; chin concolorous with the throat; white of the lower parts less pure than in the male; under tail-coverts with dark shafts.

Young. On leaving the nest the nestling has the head, back, and rump fulvescent greyish, the feathers rounded at the tips and with silky white edges and the basal portions metallic green; the lower scapulars and rump paler than the back; wing-coverts, quills, and tail deep metallic green, the terminal portions of the coverts of the same hue as the back; under surface delicate ash-grey, with finer white edges than on the back, which are separated from the grey by a fine dark border.

Bird of the year. Upper surface less glossy than in the adult, the feathers of the hind neck, rump, and tail-coverts terminally margined with white; tertials deeply tipped with the same and brownish on their terminal portions; shorter primaries tipped with white; beneath pale bluish grey, paling to albescent on the centre of the breast and under tail-coverts, which parts have the feathers tipped with brown, most extensively on the latter.

Obs. Indian examples of this Swift correspond in size to Ceylonese. Mr. Ball gives the wing of two males as 6·05 and 6·1 inches, and that of two females as 6·15 and 6·35; a female from Pegu measured 6·3.

Distribution.—The Crested Swift is diffused throughout the whole island of Ceylon, extending into all parts of the Kandyan Province and the mountain-ranges of the south. In the low country it is more common as a resident in some districts than in others; but wandering about in its powerful flight as all Swifts must do, it is liable to be met with anywhere as a straggler. I have never found it so numerous on the sea-board of the Western Province during the S.W. monsoon as at the opposite time of the year, although I have occasionally

met with it about the Slave-Island lake in the height of the boisterous weather. In the Galle district it is a very common bird, and follows the coast round to the Hambantota district in fair numbers, and thence spreads throughout the flat, jungle-clad country to the Haputale hills. I have noticed it in all parts of the Eastern Province that I have visited, and in the jungles of the northern half of the island have found it chiefly confining itself to the vicinity of the grand old tanks, such as Minery, Topare, Kanthelai, &c., and likewise affecting any large clearings which may exist in the forests of the Vanni. In the Kandyan Province it is common enough in the coffee-districts, and in fine weather may be seen about the Elephant, Kandapolla, and Horton Plains. Mr. Holdsworth does not record it from Nuwara Elliya; but I have seen it a few miles from that place, about which it no doubt flies in the course of its day's wanderings.

On the mainland this fine Swift is found, according to Jerdon, throughout Southern and Central India, but "most abundant on the Malabar coast and the Wynaad, extending up the slopes of the Nilghiris to 4000 feet or thereabouts." Mr. Fairbank only observed one example in the Palani hills. It is recorded by other observers to inhabit the sub-Himalayan districts; and Mr. Hume says, in 'Nests and Eggs,' that it breeds "below Kumaon and Gurwhal." Mr. Ball says it is found in most parts of Chota Nagpur, but nowhere abundant; he also obtained it in the Satpura range and Rajmehal hills. It extends into Burmah. Mr. Oates found it common throughout the year in Upper Pegu; Mr. Davison procured it in the pine forests north of Kollidoo in Northern Tenasserim; but in the south he did not meet with it, as it appears to be replaced there by *D. comatus* and *D. klecho*, which two species, in common with other Malayan forms, do not seem to extend much to the north of Mergui.

Habits.—This species is strikingly arboreal in its habits, haunting open hill-sides or clearings in the jungle studded with dead trees, on which it perches almost as freely as a Passerine bird. In such localities little colonies may often be met with, the majority of the birds in which will be seen dashing about with great velocity in quest of insects, while half a dozen or less are perched on the topmost branches of some tall dead tree standing among a group of rocks, where it has escaped the woodman's axe, but has been charred and killed by the fire which has swept his clearing. Here it sits elevating and depressing its crest and constantly uttering its loud call, until it dashes forth and commences to hawk round the adjacent tract with its companions, who, in their turn, settle for a while and join in the noisy cries. When thus perched the Crested Swift presents a singular appearance, its long wings, crossed widely over its attenuated tail, forming a broad arrow, the striking aspect of which is increased by the long body in continuation of it, and the crest erected as fiercely as that of a Cockatoo. When wandering about from place to place, it has a very swift flight, performed with quick and powerful strokes of the wing, varied with wide sweeps and downward plunges, from which it gracefully rises on its rapid course. At times it flies high in the air, but, as a rule, keeps a short distance above the trees of the forest or the wooded tank over which it is hawking. Jerdon remarks that "should there be a tank or pool of water or river near, it is fond of descending suddenly, just touching the water, and then rising again with unrivalled grace and speed." It utters its loud cry when flying, as do other members of the family, but not so repeatedly as when perched, at which time it appears to call to its companions on the wing, and is then very tame, allowing a near approach without taking flight. Its food consists of small flies, of which it consumes quantities, its stomach being very capacious for the size of its body.

Some Indian writers speak of the great velocity with which this Swift flies. This has never struck me as any thing very extraordinary if only compared with that of the lightning-like speed of the Spine-tail. Mr. Oates speaks of it flying over a certain bungalow in Pegu, and "dipping with incredible velocity to the surface of the Irrawaddy." It certainly has, as I have remarked above, a great speed when thus launching itself downward from its course.

Nidification.—Nothing authentic has ever been discovered of the breeding of this bird in Ceylon. The natives assured Layard that it built in old *Euphorbia*-trees; possibly it may; but this tree is not well suited to its habits, and I have never myself seen the bird about it. The inhabitants of the Malabar coast informed Jerdon that it bred in holes in trees; this certainly is erroneous, for, as a matter of fact, its curious nest, which has several times been found in India, is, according to Mr. Hume, "a little, shallow, saucer-shaped structure, composed of thin flakes of bark, gummed, probably by the bird's own saliva, against the side of a

tiny horizontal branch. The nest is nowhere more than $\frac{1}{8}$ inch in thickness, is at most $\frac{1}{2}$ inch deep in the deepest part, and can be exactly covered by half-a-crown." Mr. Thompson writes "that it is entirely filled by the solitary, rather largish, white, oval egg. The bird looks for all the world as if she were sitting on the branch, and no amount of looking from underneath would show you that there was a nest under her." The flakes of bark of which the nest is composed are sometimes mixed with a few feathers, which, cemented with the inspissated saliva of the bird, serve to bind the whole together. Mr. Hume gives the measurements of an egg in his possession as 0·85 by 0·55 inch.

PICARIÆ.

Fam. CAPRIMULGIDÆ.

Bill with the culmen short and curved and the gape very wide, receding below the eyes, and furnished, in some, with stout bristles. Wings moderate, or long and pointed. Tail of ten feathers. Legs and feet very small.

Sternum short, deeply keeled, the posterior edge emarginated.

Plumage soft and mottled. Eyes very large. Of nocturnal habit.

Subfam. STEATORNINÆ.

Bill large, inflated, the margin curved and receding beyond the posterior corner of the eye; gape enormously wide; base of upper mandible clothed with bristly feathers. Wings, when closed, scarcely reaching beyond the middle of the tail. Feet very small, the middle claw not pectinated.

Genus BATRACHOSTOMUS.

Of small size.

Bill short and enormously wide, both mandibles inflated at the sides and suddenly compressed at the tips; culmen much curved and the tip of the upper mandible hooked. Nostrils horizontal, linear, placed in a membrane, which is completely covered by the frontal plumes; gape smooth; a series of erect branching plumes in front of the eyes. Wings short, rounded; the 1st quill about two thirds of the length of the 4th and 5th, which are subequal and longest. Tail long, even at the tip much graduated, the lateral feathers very short. Legs and feet small; the tarsus shorter than the middle toe, feathered more or less in front, the bare portion scutellate. Middle toe considerably longer than the lateral toes, both of which are joined to it at the base by a membrane; hind toe short.

Sternum small, with a shallow keel, with two deep emarginations in each half of the posterior edge.

A tuft of long hair-tipped feathers springing from above the ears.

BATRACHOSTOMUS MONILIGER.

(THE CEYLONESE FROG-MOUTH.)

Batrachostomus moniliger (Layard), Blyth, J. A. S. B. 1849, xviii. p. 806, ♀; Kelaart, Prodromus, Cat. p. 117 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 165; Jerdon, B. of Ind. i. p. 189 (1862); Nevill, J. A. S. B. (Ceylon B.) 1870–71, p. 33; Holdsworth, P. Z. S. 1872, p. 420; Legge, Ibis, 1874, p. 12; id. Str. Feath. 1875, p. 198; Walden, J. A. S. B. 1875, pt. ii. Extr. No. p. 84; Hume, Str. Feath. 1876, p. 376; Tweeddale, P. Z. S. 1877, p. 439, pls. 48 & 49, et Ibis, 1877, p. 391; Hume, Ibis, 1878, p. 122.

? *Podargus javanensis* (Horsf.), Jerdon, Madr. J. L. Sc. (*nec* Horsf.).

Batrachostomus punctatus, Hume, Str. Feath. 1874, p. 354; Blanford, Ibis, 1877, p. 251; Tweeddale, Ibis, 1877, p. 391; Hume, Ibis, 1878, p. 122.

The Ceylon Oil-bird, Kelaart; *The Wynaad Frog-mouth* of Jerdon.

Collection.	Length.	Wing.	Tail.	Tarsus.	Middle toe.	Claw (straight).	Width of bill at gape.	Bill to gape.
	in.	in.	in.	in.	in.	in.	in.	in.
Ceylon.								
(1) ♀. Brit. Mus. (Whyte)	9·4 (from skin)	5·0	4·7	0·5	0·6	0·25	1·3	1·35
(2) ♂. " " (")........	8·9 (" ")	4·6	4·5	0·6	0·6	0·25	1·3	1·3
(3) ♂. Legge	9·1	4·6	4·2	0·5	0·6	0·2	1·4	1·4
(4) ♀. "	9·0 (from skin)	mutilated	4·85	0·56	0·6	0·21	1·4	1·45
(5) Juv. ♂ ?. Legge	..	4·8	mutilated	0·55	0·6	0·2	1·3	1·4
(6) ♀. Lord Tweeddale	(not recorded)	4·5	4·5	0·5	0·63 (with claw)	..	1·25	..
(7) ♀ ?. " "	(" ")	4·5	4·4	0·6	0·65 (" ")	..	1·25	..
(8) ♂. " " ..(Nevill) .	(" ")	4·68	4·5	0·5	0·75 (" ")	..	1·2	..
(9) ♂. " "	(" ")	4·75	4·75	0·5	0·7 (" ")	..	1·2	..
(10) ♂. Hume (type of *B. punctatus*).	7·75 (from skin)	4·3	4·0	0·5	0·75 (" ")	..	1·2	1·3
(11) ♀ ?. Layard (Poole Collection) ..	..	4·65	4·5	0·6	..	..	1·2	1·4
Travancore.								
(12) ♀. Hume (Bourdillon)	9·0	4·75	4·0	0·6	..	..	1·37	1·35
(13) ♂. " (")	9·0	4·75	4·5	0·59	..	..	1·4	1·4

Iris yellow; bill olive-brown or greenish brown, the under mandible paler than the upper; lower part of tarsus and feet fleshy grey, darkest on the toes; claws dark brown, inside of mouth dull greenish.

Male, nearly adult (Galle). General aspect above brown, mingled with rufous and grey, the head and upper part of hind neck being the darkest and the wing-coverts the most rufous portions. Most of the feathers of the head, hind neck, and back with a terminal spot of black; the extreme tips of the head and neck-feathers rufous, and the spots bordered above by the same, while the rest of the web is mottled with fulvous and whitish; superciliary feathers creamy white, tipped with black; feathers across the lower part of the hind neck much mottled with pale fulvous, imparting the appearance of a lightish band; on the back and rump the ground-colour is chiefly rufous and the mottlings black; the upper tail-coverts with an angular white terminal spot; outer webs of the longer lateral scapulars and the entire portion of the external shorter feathers dull white, mottled with blackish; wing-coverts boldly marked with black, and the innermost secondary wing-coverts with terminal white feathers on the outer webs; primary wing-coverts blackish brown, mottled with rufous; primaries and secondaries deep neutral brown,

more or less mottled with fulvous-grey at the tips; the outer webs of the primaries with deep rufous and buff indentations, and those of the secondaries with mottled bar-like markings of the same; tertials silvery grey, mottled chiefly with blackish and slightly with rufous, the feathers with terminal black spots; tail crossed with five mottled and vermiculated grey bands, each with an anterior irregular black border, increasing in width towards the tip, the extreme tip whitish, preceded by a black spot, outer web of lateral tail-feather chiefly buff-white with black bars.

Loral and frontal plumes tipped and barred with black; cheeks and throat pale rusty fulvous, with numerous black cross pencillings, the feathers just beneath the gape darker than the rest; feathers across the lower part of the fore neck with large white terminal spots, in some of which the portions of the extreme tips and an anterior border are black; beneath from the chest pale fulvous, mottled with blackish, many of the feathers at the sides of the breast with the terminal portions pure white, conspicuously marked with black cross pencillings; abdomen, thigh-plumes, and under tail-coverts more fulvous than the breast and less mottled, and crossed with regular black lines; longer under tail-coverts with terminal white spots; under wing-coverts pallid rust-colour with blackish markings; tarsal plumes pale fulvous, marked with blackish brown.

Male (British Museum, *ex* Whyte). Slightly less rufous above than the foregoing, with the black terminal markings deeper, and the whitish stipplings across the hind neck clearly defined; the scapulars with more white, and the terminal spots larger, which is likewise the case with the tertials and outer and median wing-coverts, the spots on the latter preceded by bold black markings; the light indentations on the outer webs of the primaries larger and more albescent; tail paler in the ground-colour, the bands the same; throat and chest less rufous, the white breast-spots larger and the black anterior edges bolder.

This specimen, I conclude, is somewhat older than the foregoing. An adult (?) male, described by Lord Tweeddale in his excellent monographic notice (P. Z. S. 1877, p. 442), is similar to the above examples, with the exception of a white collar across the hind neck, thus portrayed:—"Nuchal plumes with a subterminal white band confined between an upper and a terminal dark brown transverse line: a well-defined nuchal collar is thus formed." The outer rectrices have pure white marginal spots; the margins of the white throat- and breast-spots are described as dark brown instead of black; the wing-coverts are terminated with very bold white spots; the breast and flanks appear to be more rufous than in my specimens; but the greater development of the white markings pronounce it, I think, to be one of the oldest birds yet procured.

Young male? It is probable that the young of this sex have a grey or cinereous character from the nest, though the plumage may be much mixed with rufous. I have an example (No. 5 in the table of measurements) of a dark brown general aspect, with the wing-coverts rufous and with most of the upper plumage mottled with fulvous, which I take to be a male, on account of its very pale scapulars, the black tippings of the hind neck and inter-scapular region, and the spotted appearance of the breast above the lower pectoral region where the white black-bordered spots exist. In the females I have examined the breast is of a uniform hue from the white necklace down to the ventral spottings; there is a pale supercilium, the feathers being tipped with black; the narial plumes have the terminal portions black, as are also the bases of the feathers round the gape; the tips of the auricular plumes are blackish brown; the lateral scapulars are fulvous-white, with black terminal spots, and the greater wing-coverts have large terminal white spots; some of the long nuchal feathers are barred with black, with a light edge, but there is no further indication of any collar; the outer webs of the primaries are rusty fulvous; the under surface is rufescent fulvous, the breast mottled with black and tipped with the same; the white throat-spots have an anterior border of black, the white extending to the tip, and the same is true of the ventral and lower flank-feathers. I regret to say that the rectrices are wanting in this interesting specimen (No. 5), it having knocked itself about while in confinement in Kandy and lost the entire tail. Both in this and the first example described in this article there is a very remarkable tuft of downy undeveloped feathers, similar to that well known in the Herons, springing from the side just above the femur; it lies so close to the skin that it is with difficulty detected.

A presumed immature male described by Lord Tweeddale (*loc. cit.*) has a greyish-brown general aspect; the super-ciliary plumes are rusty fulvous on the outer webs and brown on the inner; a few feathers on the nape slightly tipped with white, some with fulvous, forming "a rudimentary uncompleted nuchal collar;" rest of the upper plumage somewhat similar to the first specimen above described, but more rufous, and the margins of the white spots brown; the chin and throat are rusty, and the white necklace well developed; upper pectoral plumes rusty, the lower fulvous-grey, broadly tipped with white. The wing in this specimen (which is No. 9 in the above Table) is 4·75, a very large dimension indeed for an immature male; and I have no doubt that some of these rufous males are older than has been supposed, and that adults will be found, when a large series has been got together, to vary somewhat in the character of their plumage.

Adult female (British Museum, *ex* Whyte; No. 1 in table of measurements). General hue of head, hind neck, back, rump, and wing-coverts dull rufous, darkest on the back and lesser coverts, and very pale on the tertials and outer scapulars, the whole very closely and finely stippled with dark cinereous brown, deepening into a blackish hue on the wing-coverts; the brown hue of these mottlings overcomes the rufous on the head and hind neck, which parts have an ashen tint; feathers of the forehead with a small black subterminal spot succeeded by a fine white tip; across the lower hind neck the feathers are terminated with broad white bars, bounded above and beneath with a black border; the median row of wing-coverts with the same, without the terminal black border; greater secondary coverts, an indistinct pale terminal spot, secondaries, and the primaries with their coverts dark ashen brown, mottled at the tips with fulvescent rufous: the outer webs of the primaries with a deep wavy rufous edge; tail rufous, crossed with six indistinctly defined mottled bands; the outer feathers indented outwardly with white, and crossed with black markings on the outer webs; the extreme tips of the feathers fulvous, preceded by a black edge. Loral plumes blackish, rufous at the base; over the eye a pale undefined streak; under surface very similar to the upper in hue, as far as the middle of the breast, when the ground-colour becomes fulvous and extends thus to the abdomen and under tail-coverts; across the throat a band of large terminal white spots bordered by a black edging; terminal portions of the lower-breast, flank-, and abdominal feathers whitish, with transverse black vermiculations and a border of the same at the tips; under tail-coverts with a black-bordered terminal white spot; under wing-coverts rufous, faintly mottled with blackish brown.

Another example in my collection has the upper surface almost uniform rufous; there are indistinct mottlings on the scapulars and upper tail-coverts; the latter have the tips slightly paler than the rest of the feathers; the crown is rufous-brown, with the long auricular feathers rufous. The nuchal feathers have the white black-bordered bars forming the collar somewhat distant from the tips of the feathers; the scapulars have a terminal black white-tipped spot, the wing-coverts a very large white anteriorly bordered spot on the tips of the outer webs; the tail is crossed with mottlings of blackish brown gathered into the form of bars, and the penultimate or second lateral feather has the outer web indented with fulvous-white and crossed with black; supercilium pale fulvous; the chin is rufescent fulvous; the chest bright uniform rufous, with the normal white necklace; on the lower breast the feathers change abruptly on their terminal portions into white, pencilled with black; the under tail-coverts have a white black-bordered tip; the abdominal feathers have the middle portions pale fulvous.

Another in the Poole collection (the specimen mentioned by Layard in his Notes) is very similar to this; the nuchal collar and necklace are the same, but there are a few black terminal spots on the frontal feathers just behind the long plumes; the tertials and scapulars are both marked with white terminal spots surrounded by a deep black border; the chest and breast are very rufous as in the above. I am of opinion that these last two specimens are fully aged females; they agree in having the upper surfaces almost uniform in their hue, the mottlings being almost obsolete.

A similar bird (No. 6 in the table of measurements) is described by Lord Tweeddale, *loc. cit.* pl. 49. Judging from the minute description of this bird given by his lordship, it corresponds almost feather for feather with the rufous example treated of above; the tail is perhaps slightly less uniform than in mine, but the upper surface and chest have the same unmarked rufous ground-colour, and the wing-covert spots, nuchal collar, and necklace are likewise to all intents similar.

In a second female example noticed by his lordship the rufous is still deeper in tone than in the latter; the distribution of the white markings the same, but the white bars and terminal rufous-brown fringes of the nuchal-collar plumes are more pronounced.

Young. The nestling procured by Mr. Bourdillon and noticed below was probably a female, and is described by Mr. Hume as "a curious little rufous-brown ball with the characteristic bill of the species, and with distinct traces of black terminal bars to the feathers of the upper back and scapular region."

Obs. At the risk of being wearisome to the most scientific of my readers I have given as complete a series of observations on the plumages of this most remarkable of Ceylonese birds as it was in my power to do. This was, I think, necessary, as there has been so much controversy on the subject of Mr. Hume's presumed new species from Ceylon, *B. punctatus*, which I have thought expedient to unite with the present. This bird, as will be seen at a glance at the above table of measurements, is most variable in size, irrespective of sex. Some males exceed the average of females; but the latter will, I think, be found to contain larger birds in their ranks than the former. Blyth's type specimen, sent to him by Layard, was evidently a large female; while Mr. Hume's (No. 10 in the above list), sent to him, I believe, by Mr. Nevill from the south of Ceylon (where I have obtained a similar example), was a very small male. It would take up too much room in my pages to recapitulate Mr. Hume's description of his specimen, and it will suffice to say that it is a grey bird, corresponding exactly in plumage with those above described. Mr. Hume remarks, at page 122 of 'The Ibis' for 1878, "In no adult *B. moniliger*

does the wing fall short of 4·7 inches; in *B. punctatus*, on the other hand, of which several specimens have now, Mr. Whyte informs me, been obtained, the wing appears to be always under 4·5 (in the type it is only 4·3)"*. With regard to the size of *B. moniliger*, I refer my readers to the above table; in respect to that of Mr. Hume's *B. punctatus*, I have only to remark that the second male specimen described in this article (a strictly *punctatus* type of bird) has lately been sent home by Messrs. Whyte and Co. with "*sp. incog.*" written on the label (!)—proof evident that these naturalists do not know which phase of plumage represents *B. punctatus*. The female of Mr. Bourdillon's pair, sent from Travancore to Mr. Hume, is similar to the example from Ceylon described by Blyth, and the male, as described by Mr. Hume, corresponds exactly with my Southern Ceylon one. If, however, these Travancore birds prove different from Ceylonese, a new title should be bestowed upon them: and then *B. moniliger* will stand as one of the peculiar Ceylonese forms. That there should be two species of this rare and remarkable genus in Ceylon is most unlikely.

Distribution.—The Frog-mouth is widely spread throughout Ceylon, but is very seldom procured, as it is strictly nocturnal and an inhabitant of the inmost recesses of the jungle. Two examples were brought to Layard from the Western-Province jungles round Avisawella and Ratnapura, and a pair were met with near the latter place by Mr. Mitford. One was obtained by Mr. Nevill near Amblangoda, in the south of Ceylon, and another by myself at Wackwella near Galle. A third was shot in the Chilaw district in 1868 by the taxidermist of the Colombo Museum. Two more were captured on their flying into houses in Kandy at the latter end of 1875 and the beginning of 1876. In March of the former year Major Sandford, of the Royal Engineers, came upon one seated asleep on a branch in low jungle near the Peria-Kulam tank, Trincomalie, and described to me its toad-like and inanimate appearance as it sat with its bill pointed upwards. In February 1875 Mr. Edwin Watson met with another, under similar circumstances, in jungle above Ragalla Estate, at an elevation of 5600 feet. Besides the above-mentioned examples, there are the male and female sent home to the British Museum by Messrs. Whyte and Co., both of which were procured near Kandy, the latter at the end of last year, and the former on the 30th of January of the present year. The south-eastern, eastern, and north-western portions of the island are therefore the districts in which the Frog-mouth has not yet been procured or observed; and of all parts in which it has been found the neighbourhood of Kandy is that in which it has proved most numerous. It is, however, in my private opinion, much more common than is supposed; for throughout much of the northern forest-tract, as well as in many of the bamboo-districts between Colombo and Ratnapura, I have heard a singular note which I firmly believe is that of this bird. It is uttered just about sunset, and from that until about 10 o'clock, and is renewed again at daybreak on the following morning. It always proceeds from dense jungle, and all my efforts, which were many, proved fruitless in getting a sight of the mysterious bird.

The Frog-mouth of South India, which is presumably the same as the Ceylonese, has been found in the Wynaad and in the Travancore hills up to an elevation of 2100 feet; north of these districts it has not as yet been traced.

Habits.—This singular nocturnal bird frequents thick bamboo-jungle, dense thickets, low umbrageous jungle, and such-like localities. It does not appear, as a rule, to sally forth before dark into the open, as I know of the testimony of but one person who has ever seen them out of jungle. Mr. Mitford, as quoted by Layard in his Notes, says that he observed a pair "frequenting a tree in full flower and capturing the beetles which flew about it." Its position of rest during the day is seated across a branch with the bill pointed straight upwards and its eyes of course fast closed. The bird which I was fortunate enough to meet with was perched on a low bamboo in a dense thicket through which I was creeping. I was close to it when I first saw it, but it was not awake; and struck with its extreme likeness in general aspect to *Podargus cuvieri*, with which I was acquainted in a state of nature, I at once identified it as the much sought after Frog-mouth, and crept away to a convenient distance for shooting it. While moving off a slight crackling of the sticks beneath my feet awoke it, and it slowly turned its head round in my direction, but I do not think it saw me. Its stomach contained beetles, which form, to a considerable extent, the food of the *Podargi* in Australia. In the stomach of one of these latter I once found a green stone of considerable size, from which I infer that

* 5·5 and 5·3 in 'The Ibis'; presumably a printer's error (*vide* Str. Feath. 1874, p. 354).

perhaps these birds pick their food from the trunks of trees as well as capture it on the wing; in so doing the *Podargus* most likely took in the stone, which easily descended its capacious throat. Layard writes of one of the two examples he met with, that "it lived three days with me, but refused all food; during the day it slept, squatting on the ground with its head sunk between its shoulders: on being alarmed it sprang upwards with a sudden jerk, and after executing a rapid summersault in its confined cage, it would again alight and settle down like the *Caprimulgi.*" Mr. Whyte, of Kandy, kept one, which was taken in a room into which it had flown, for some few days, during which I saw it; it perched on the bottom of the cage with its head up, and when approached and awakened would open its eyes and mouth wide, glare at me and then commence slowly closing its mandibles, which finally came together with a sudden jerk. I made it repeat this gesture several times, and the mouth always closed in the same curious manner.

Mr. Bourdillon speaks of the peculiar note which I have alluded to above, and likens it to "a loud chuckling cry, with something of the tone of a Goatsucker and not unlike the laugh of a Kingfisher." It is, as he remarks, a difficult call to describe; but his representation of it is, I think, the best that could be given. I will leave it to my numerous ornithological friends and acquaintances in Ceylon, who will, I hope, be interested in this bird, to prove whether or not this is its note. On one or two occasions I heard it in an isolated bamboo-thicket in the Ratnapura district; but I was too hurried to halt for the night and search the copse in the morning, which would probably have resulted in my finding the Frog-mouth had it been there.

Nidification.—The members of this remarkable subfamily of the Caprimulgidæ differ from their allies the true Goatsuckers as much in their nesting-habits as in their anatomy. The *Podargi* of Australia construct a nest which they fix on the limb of a tree, and the smaller *Batrachostomi* of Asia nest in a similar manner. Nothing has been discovered concerning the Ceylonese Frog-mouth's nesting; but I will subjoin the following interesting account of the nidification of the Travancore bird, inasmuch as I think it applies to the Ceylonese one as well. Mr. Bourdillon is the only person who has been fortunate enough to discover any particulars concerning the nidification of any of the *Batrachostomi.* The nest to which he refers in the following notes, which Mr. Hume kindly sends me, was found on the 24th of February 1876, in rather open jungle at an elevation of 2100 feet on the Travancore hills.

Mr. Hume says, *in epist.,* Bourdillon's account of the nest of *B. moniliger* is as follows:—

"The nest was brought to me one evening by a coolie who had been working in the jungle.

"It was composed of vegetable down neatly and compactly interwoven with pieces of dead leaves, fragments of bark and dry wood, and one or two pieces of lichen. In shape it is a sort of disk about $2\frac{1}{2}$ inches broad and $1\frac{1}{4}$ inch deep, the upper surface being slightly hollowed out. The young one, partially fledged, was unmistakably a Frog-mouth, from the colour of his plumage, bill, and huge gape. On receiving the nest I at once went with the man, and restoring it to its original position, sat down to watch.

"The chick (I quote from my notes) was much pleased at finding himself in his old quarters, and repeatedly shook himself, as if he could not at first settle down into a comfortable position, this shaking being attended with some danger, as once or twice the bird seemed within an ace of rolling out of the nest. At intervals of about ten minutes it uttered a feeble chirruping call, not unlike an "Ice"-bird at a distance. As darkness increased its cry was more frequent and became a single chirp. I watched till night closed in and it became pitch dark without seeing any thing of the old bird, though once something which might have been either bird or bat flitted past.

"Next morning I returned some time before sunrise, and in the moonlight had a good view of one of the old birds seated on the nest.

"It was in a very peculiar position, more lying down than sitting, with its head well up in the air. The nest was not 15 feet from the ground, in a fork of a sapling, apparently without any attempt at concealment, so that I was able to approach very close to the bird, which, without moving, merely opened its large eyes to stare at me. Now comes the worst part of the story. I was so anxious to secure the specimen that I determined to shoot it on the nest; accordingly I retired as far as possible and fired, the result, owing to intervening bushes, being that, to my great disappointment, the bird went off into the jungle hard hit and was lost.

"Thinking at first the bird could not possibly have escaped I searched about for it, and at the foot of the small tree where the nest was I found the remains of an egg. These I have kept and will send with the nest, as I at least have no doubt that they originally enclosed the young Frog-mouth. You will see, from these fragments, that the egg of the bird is probably pure white, almost round, of thin texture, and with a smooth, glossless surface."

PICARIÆ.

CAPRIMULGIDÆ.

Subfam. CAPRIMULGINÆ.

Bill short, very weak and flexible, the tip hooked slightly. Nostrils tubular; gape furnished with stout bristles. Wings and tail long. Middle toe with the claw pectinated.

Genus CAPRIMULGUS.

Bill short, very wide at base, suddenly compressed towards the tip, which is gently curved and grooved parallel to the culmen. Gape enormous, and protected by long stout bristles. Wings long and pointed; the 3rd quill the longest, and the 1st shorter than the 4th. Tail moderately long and expanding slightly towards the tip, which is even. Tarsus short, more or less feathered, the bare portion in front covered with transverse scales; lateral toes short and united to the middle at the base by a membrane; claws straight, the middle one with the inner edge strongly pectinated.

CAPRIMULGUS KELAARTI.

(KELAART'S NIGHTJAR.)

Caprimulgus indicus, Blyth, J. A. S. B. 1845, xiv. p. 208.

Caprimulgus kelaarti, Blyth, J. A. S. B. 1851, xx. p. 175; Kelaart, Prodromus, Cat. p. 117 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 167; Jerdon, B. of Ind. i. p. 193; Holdsworth, P. Z. S. 1872, p. 421; Hume, Nests and Eggs, i. p. 97 (1873); Morgan, Ibis, 1875, p. 314; Bourdillon et Hume, Str. Feath. 1876, p. 381.

Caprimulgus indicus, Jerdon, Cat. Madr. Journ. no. 251; Ill. Ind. Orn. pl. 24 (1847).

The Nilgherry Nightjar, Jerdon; *The Newara-Elliya Goatsucker*, Kelaart; *Night-Hawk*, Europeans in Central Province.

Bim-bassa, Sinhalese, lit. "Ground-Owl"; *Pay-marrettai*, Tam., lit. "Devil-bird."

Adult male. Length 10·0 to 10·6 inches; wing 7·0 to 7·5; tail 4·1 to 5·0; tarsus 0·6; middle toe and claw 0·8 to 0·85; bill to gape 1·2 to 1·3. Expanse 22·4.

Female. Length 9·5 to 10·0; wing 6·9; tail 4·6.

Iris deep brown; eyelid brownish yellow; bill vinous brown, paler at the gape, the tip black; legs and feet vinous brown, darker on the toes; soles pale, claws blackish.

Male. Light portions of head, back, and wings pale cinereous, finely pencilled with dark brown, and mottled on the hind neck, wing-coverts, and scapulars with white; over the centre of the forehead and crown a broad black stripe; feathers of the back, rump, and upper tail-coverts crossed with wavy marks of black; the scapulars with velvety black centres and tips of an arrow-shaped or bar-like form set off by pale buff margins; wing-coverts blackish brown, mottled on the inner webs with cinereous, and with a conspicuous terminal buff, dark-mottled spot on the outer webs; tertials with black mesial portions and boldly pencilled with dark brown; quills blackish brown, clouded with cinereous at the tips, and with a round white spot on the inner web of 1st primary and a broad bar across the next three, generally interrupted on the 2nd; the outer quill indented with buff-white; tail black, the central feathers with mottled cinereous transverse spaces, the remainder with mottled, distinctly separated bars, and the four outer feathers with a large subterminal white spot.

A white stripe from gape to beneath the ear-coverts; across the throat a white band, interrupted in the centre and edged below with rich ferruginous buff, which reappears on the sides of the neck, and is continued as a white tracing round to the centre of the hind neck; throat, chest, and upper breast light cinereous, crossed with blackish pencillings, which on the lower parts take the form of dark bands on a whitish ground; belly and under tail-coverts whitish buff, the latter with a few brown bars.

Female. Darker above and also on the chest than the male: spots on the quills buff, of smaller size than in the male, and that on the 2nd quill interrupted in the centre: the four outer tail-feathers wanting the white terminal spots, and merely having a pale bar at the tips mottled with brown.

Note. The group to which this species and *C. indicus* belong is distinguished by having the tail, in the male, with the four outer feathers on each side terminated with a white spot and the tarsus feathered.

Obs. Jerdon first pointed out the differences between Southern Indian examples of this species and *C. indicus*. Blyth afterwards noticed them in 1845, *loc. cit.*, in an example from the Nilghiris, which he, however, still recognized under the latter name. Subsequently, in 1851, he described the species from specimens sent from Ceylon by Dr. Kelaart as *C. kelaarti*, finding these identical with his Nilghiri bird. It differs from *C. indicus* in its more cinereous or albescent hue compared with the rufous tint of the latter, and also in the more mottled black markings, which give it altogether a darker shade. It is likewise, at least so Blyth considered, a smaller bird. Of late years, however, Hume, from the evidence afforded by a large number of examples from different parts of India, finds that neither of these distinctions will hold good as regards peninsular birds, and remarks that every intermediate link between the two typical forms occurs over all India. Some of the very smallest birds are rufous ones from

Mahabaleswar and Ahmednuggur, and also from Raipore, Sankra, and Etawah, while silver-grey and black-mottled birds are found near Simla, altogether out of the accepted range of *C. kelaarti*. Moreover in Travancore Mr. Bourdillon has procured both grey and rufous birds, the latter being quite as much so as North-Indian specimens. There is no reason, however, that the two species should not inhabit the same regions; and if we extend the limits of the range of each, this difficulty will be got over. As regards the Ceylonese birds, it is necessary to remark that they are all grey and like typical *C. kelaarti*, which militates against the possibility of suppressing the species in Ceylon, whatever may be done in future as regards India, where it seems difficult to draw the line of separation between it and *C. indicus*. Two of Mr. Bourdillon's specimens from Travancore measure—♂, wing 6·75 inches; ♀, wing 7·25. In Ceylon the females are much the smaller of the sexes.

Distribution.—This very handsome Nightjar, first noticed in the island by Dr. Kelaart, and named by Blyth from specimens sent him by the Doctor, is almost entirely confined to the mountain-zone, and therein inhabits chiefly the upper ranges and the higher parts of Uva. I have seen it in great numbers about Nuwara Elliya, where its discoverer remarks, in his 'Prodromus,' that it swarms in the dusk of the evening in the marshy plains. It is, however, equally abundant during the S.W. monsoon in all the higher parts of the main range which are open and favourable to its habits, such as the Kandapolla and Elephant Plains and similar localiti s as far south as the Horton Plain. It appears to leave these high regions for warmer districts during the cold nights of the opposite season, as I found it rare in all the above districts in December, and did not meet with it at all on the elevated plateau between Totapella and Kirigalpotta. In Haputale and other parts of Uva, as well as in most of the coffee-districts of about 3000 to 4000 feet in altitude, it is common enough throughout the year; but it is almost unknown in Dumbara, its usual limit being the neighbourhood of Deltota and Hewahette on the south of the valley, and Kalebokka on the north. It does not appear to have been hitherto known from any portion of the low country, although Mr. Holdsworth records as his opinion the probability of its leaving Nuwara Elliya during the cold season; but in August, 1875, I met with it in one locality of the Eastern Province which is at the sea-level, and where it was not at all to be expected. This was in the forest-region at the base of the Friars-Hood group of isolated hills, which form so prominent an object in the Batticaloa country. This tract is connected with the eastern slopes of Uva by detached groups of hills; but they spring from a low base, and are not situated in such a manner as to favourably foster a migration from the mountains to such a remote part as the Devilane district; and I therefore am inclined to think that the species must be resident in portions of the Eastern Province, particularly as I found it there at the season when it flocks to the upper hills. In corresponding parts of the Western Province, which lie much higher than the Friars Hood, it does not appear ever to be found; nor have I any evidence of its inhabiting the Morowak-Korale mountains, although it doubtless does do so, but has been overlooked by gentlemen collecting in that part of the island.

On the continent of India, Kelaart's Nightjar is found in the Nilghiris and the wooded Ghâts of the Central Provinces, all over which latter hills Mr. R. Thompson records it as being common. Mr. Bourdillon notes it as a winter visitor to the Travancore hills, occurring rather abundantly from November until March. It must, in this case, ascend the range from the low country, which is the very opposite of its habit in Ceylon. I observe that Mr. Fairbank did not meet with it on either of his trips to the Palani hills, which does not augur in favour of its being widely spread in the mountains of South India.

Habits.—This Nightjar affects stony patnas, open glades in the forest, and all the confines of the Downs or so-called Plains which are such a singular feature of the fine jungle-clad ranges of Ceylon. It hides during the day among rocks near the edge of the jungle or among coffee-bushes, and from such places of concealment sallies out early in the evening and on all sides simultaneously is heard its curious call-note, *chump-pud, chump-pud*, repeated for several minutes and then suddenly stopped on the bird moving out to some conspicuous perch, such as a stump or huge rock, from which it recommences to utter its call. It is a very noisy bird in the breeding-season, but in the cold weather is almost silent, a peculiarity which was curiously noticeable in the birds I met with at Devilane tank, which, on three consecutive evenings before I shot them, were observed silently hawking on the bund of the tank. This species has a bold and dashing flight, rapidly and noiselessly performed, with frequent dexterous turns in the air, as it seizes its prey, and when disturbed in the daytime it quickly darts off and realights on the ground. It is, however, more rarely flushed during the day than either

of the two following species, as it lies very close and does not repose in open spots like the Common Nightjar.

Dr. Jerdon writes, in his 'Birds of India,' that "it is now and then flushed from the woods when beating for game; and more than one has fallen before the gun of the inexperienced sportsman, its extent of wing and the lazy flapping having caused it to be mistaken for the Woodcock." I have myself observed this peculiarly lazy flapping, which is not the usual mode of progression, at sunset, and several times have heard the strange sound which the bird makes, resembling the beating of an immense fan or wing in the air: whether this is caused by the motion of its pinions, or by the utterance of a guttural note, I am unable to say; but much as it resembles a mechanical effect, it is doubtless the result of some curious vocal power in the bird. Its food consists almost entirely of beetles, of which it consumes immense numbers, its stomach being crammed with these, one would think, indigestible insects at an early hour in the evening. It is worthy of remark that the majority of specimens procured of this species are *males*: what becomes of the females in the evenings it is hard to say; but one thing is certain, that they keep out of the way and are seldom shot, except when flushed in the daytime from their nests or in company with a young brood.

Nidification.—Mr. Holdsworth remarks that the breeding-season about Nuwara Elliya commences in March and April. Its eggs appear to be seldom found; and the only instance of their being taken that ever came under my notice was related to me by a gentleman in Haputale, who informed me that his sons sometimes procured them on the estate. In India they are well known. In the Nilghiris and Central Provinces, according to Mr. Hume's correspondents in 'Nests and Eggs,' it commences to breed in March and continues to lay until August. The eggs are deposited "in a slight depression under a bush or tuft of grass;" but they have been found, Mr. Davison relates, in a heap of ashes produced by the *Burgas* burning weeds in their fields. The eggs are two in number, and are said to be counterparts of those of the closely allied *C. indicus*; they are of a pale yellowish or salmon ground-colour, marbled with brown among blotches of a lighter shade, which sometimes resemble a darker tint of the ground-colour; they are long ovals in shape, and "vary from 1·08 to 1·23 inch in length, and from 0·8 to 0·9 inch in breadth."

Mr. Rhodes Morgan on one occasion found the eggs deposited on a heap of ashes; he describes them as of a "pinkish buff, blotched with pale violet-brown."

CAPRIMULGUS ATRIPENNIS.

(THE JUNGLE-NIGHTJAR.)

Caprimulgus atripennis, Jerdon, Ill. Ind. Orn. pl. 24, letterpress (1847); id. B. of Ind. i. p. 196; Holdsworth, P. Z. S. 1872, p. 421; Legge, Ibis, 1874, p. 12.

Caprimulgus spilocercus, Gray, List Fissirostres Brit. Mus. p. 7 (1848); Hume, Stray Feath. 1873, p. 432.

Caprimulgus maharattensis (Sykes), Kelaart, Prodromus, Cat. p. 117 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 166.

Maharatta Goatsucker, apud Kelaart; *The Spotted-tailed Goatsucker*, Gray.

The Ghât Nightjar, Jerdon; *Goatsucker, Night-Hawk*, Europeans in Ceylon.

Bim-bassa (West Prov.), *Ra-bassa, Omerelliya* (South Province), Sinhalese; *Pathekai*, lit. "Roadside-bird," Jaffna Tamils, also *Pay-marrettai* (Jerdon).

Adult male. Length 10·6 to 11·0 inches; wing 7·0 to 7·2; tail 4·9 to 5·3; tarsus 0·7; middle toe and claw 0·95 to 1·0; bill to gape 1·3 to 1·4.

Adult female. Length 10·0 to 10·4 inches; wing 6·6 to 6·7.

Iris deep brown; eyelid pale reddish (yellowish in female); bill reddish brown, tip black; legs and feet reddish brown or pale reddish, claws dusky brown.

Male. Top of the head and upper part of hind neck cinereous brown, very finely stippled with grey, the feathers of the centre of the crown and nape having broad black mesial stripes, the ground-colour of the latter part passing with a ferruginous hue on the hind neck into the blackish of the back, rump, and upper tail-coverts; the margins of the feathers on these parts stippled with fulvescent grey, and the black confined chiefly to a central stripe; scapulars very handsomely marked with oblique bands and spade-shaped patches of velvety black, the shorter feathers with oblique external margins of rich buff, the longer feathers being mostly grey near the tips, vermiculated with blackish; lesser wing-coverts blackish, mottled with ferruginous; anterior feathers of the remaining series black, marked with mottled spots of buff, and in some examples with white tips to many of the feathers; inner secondary coverts mostly mottled with grey on a black ground, and with buffy white tips to some of the feathers; primaries blackish brown, mottled at the tips with pale cinereous; the 1st quill with a white spot on the inner web, and the next three with a white bar in continuation, interrupted on the 2nd quill at the centre; inner secondaries paler than the primaries, marked in places with ochraceous buff; tertials mottled with cinereous grey at the tips: tail blackish brown, the four central feathers mottled with dusky fulvous, the two lateral feathers on each side black, with the terminal third white and the lateral margin tinged with buff, inner margins of all indented with buff.

Lores and ear-coverts russet-brown, mottled with black; rictal bristles black, with white bases; chin and along the base of lower mandible mottled black and fulvous; a thin white stripe at the gape; across the throat a broad white band, its lower edge deeply margined with black, or, in some, barred with this hue and tipped with rufous-buff; chest and upper breast cinereous, finely stippled with brown, and the latter part washed with a russet hue; beneath this the under surface is fulvous, crossed with narrow bars of blackish brown, the centre of the breast being, in many specimens, slightly albescent; under wing-coverts fulvous, cross-marked with brown.

The scapulars vary much in this bird, scarcely any two examples having them marked the same; in some individuals the broad oblique buff margins are almost entirely wanting; the white tips of the wing-covert feathers likewise are variable.

Female. Has not the scapulars so conspicuously marked as the male; the wing-spots are buff or buffy white, small and bar-shaped, that on the 4th quill almost wanting; two lateral rectrices on each side with a buff-white tip, varying up to half an inch in depth, or with the tip only mottled with buff (such examples being probably young); white throat-spot smaller than in male, ground-colour of lower parts duller.

Young (male of the year). Wing 6·6.
Bill and feet paler than in adult.
White tail-spots smaller than in adults, the black running out on the outer web much further than on the inner; the outer margin of the white spot mottled with brown; throat-bar as in females.

Note. The section to which this species and one or two others in India belong is characterized by having the two outer tail-feathers in the male terminated with white and the tarsus feathered.

Obs. Layard speaks of *C. mahrattensis*, in conjunction with *C. asiaticus*, being very abundant in the vicinity of Colombo and throughout the Southern Province. As there is no other Nightjar besides the latter which is common, or even found, in the districts named, it follows that *C. mahrattensis* was mistaken for the present species, as Mr. Holdsworth (*loc. cit.*) has already suggested. Mr. Hume points out ('Stray Feathers,' 1873) that Ceylon specimens do not agree over well with Nilghiri ones.

Distribution.—This fine Nightjar is a denizen more or less of the entire sea-board of Ceylon, and extends into most of the inland districts, being very numerous in all parts which are clad with forest or are even moderately well-wooded. Mr. Holdsworth does not record it from Aripu on the north-west coast; but it is abundant in parts of the Jaffna peninsula, and I have met with it on the coast at Illepekadua, north of Mantotte, and at Pomparipu to the south of it; so that I imagine it is simply locally absent from the open country near the Pearl station, and probably an inhabitant of the adjacent interior. It is very numerous in the northern forest-tract and around Trincomalie, in the wooded districts of the south-west from Kalatura round to Tangalla, and in the jungle-country north of Kattregama. The same may be said of the country north of Kurunegala and many parts of the Western Province, although I found it conspicuously absent from most parts of Saffragam. It ranges into the hills up to an altitude of about 3500 feet, at which elevation I have seen it in Hewahette, and in Dumbara it is common. Mr. Parker does not record it in his letters to me from the Uswewa district; but I have no doubt that it is found there.

On the mainland, the Ghât Nightjar, as it is styled by Jerdon, is found in various parts of the south of India, to wit, on the Malabar coast and in the Ghâts of the north of the Carnatic. It is tolerably common in the Nilghiris; but Mr. Bourdillon has not procured it in the Travancore hills, nor Mr. Fairbank in the Palani ranges, which proves that it is a bird of local distribution in the peninsula.

Habits.—This species inhabits dry forest, low jungle, scrub, and wooded tracts in semicultivated country. It is very partial to the "cheena"-woods in the Galle district, and similar secondary jungle in the east and north of the island, such haunts affording it secure shelter whilst it roosts on the ground, and from which it sallies out at dusk, settling in roads, pathways, or any bare spaces in the woods. I have always observed that it avoids localities in which there are not large trees, which habit is exemplified in its locating itself in numbers about the outskirts of the cinnamon-gardens at Colombo, while it does not haunt the open bushy gardens themselves, where the next species is so common. It comes out a little later than the Small Nightjar, first of all flying up to a low stump or branch and uttering its curious call, like the striking of a hammer on a thin plank; as soon as it is heard this cry is answered by its companions, and in a few minutes these notes resound on all sides and are continued until it is dark enough for the birds to take wing in pursuit of the myriads of beetles and other insects which throng the calm air of a tropical evening. This loud note is generally preceded by a low *grog, grog-grog*, which can only be heard when one is close to the bird. It is a gluttonous feeder, its stomach being generally crammed with beetles or winged termites before dark, which it captures with a powerful swooping flight, often sailing along with very upturned motionless wings. It is just as fond of sitting on roads and paths as the next species; but it is not so tame, and will not suffer itself to be almost kicked as it will. The Tamils in the north of Ceylon call it the "roadside bird" from this habit, and have a strange superstitious notion that it has the power of plucking out the eyes of their cattle; but they do not seem to be able to account for the fact that there is no ocular testimony of this objectionable habit ever having been put into practice! It is noteworthy that this Nightjar perches continually on the tops of small dead branches of low trees; and once I think I saw it sitting in a diagonal manner, though not quite transversely, across a branch, as an ordinary Passerine bird would have done.

Nidification.—In the west of Ceylon the Jungle-Nightjar breeds during the latter part of the dry season

and the commencement of the monsoon rains in April and May. It lays two eggs in a slight depression in sandy ground, beneath the shelter of a shrub; they are of a buff ground-colour, and very sparsely spotted with very dark sepia-brown, rather roundish blots. I have seen several eggs, and have not detected any of the streaky markings peculiar to those of other Nightjars. I unfortunately have no data of the size of this Nightjar's eggs, as I omitted to measure those which I examined in Mr. MacVicar's collection; they are, however, considerably larger than those of the next species, measuring, according to Layard, "14 lines by 11 lines." The dimensions given by Mr. Hume of a pair of eggs from the Nilghiris, viz. 1·13 inch by 0·72, and 1·01 by 0·74, are, I am sure, inferior to those of Ceylonese birds.

CAPRIMULGUS ASIATICUS.

(THE COMMON INDIAN NIGHTJAR.)

Caprimulgus asiaticus, Latham, Ind. Orn. ii. p. 588 (1790); Gray & Hardwicke, Ill. Ind. Orn. i. pl. 34. fig. 2 (1832); Sykes, Cat. J. A. S. B. iii. no. 30 (1834); Blyth, Cat. B. Mus. A. S. B. p. 83. no. 415 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 115 (1854); Holdsworth, P. Z. S. 1872, p. 419; Hume, Str. Feath. 1873, p. 432; id. Nests and Eggs, p. 97 (1873); Adam, Str. Feath. 1873, p. 371; Legge, Ibis, 1874, p. 12, et 1875, p. 281; Ball, Str. Feath. 1874, p. 385; Butler, ibid. 1875, p. 455.

The Indian Goatsucker, Kelaart; *Night-Hawk*, *Goatsucker*, "*Ice-bird*," Europeans in Ceylon (the latter name from the resemblance in the bird's note to a stone scudding on ice).

Bim-bassa, *Ra-bassa*, Sinhalese; *Pathekai*, Tamils in Ceylon.

Adult male. Length 8·9 to 9·1 inches; wing 5·65 to 5·8; tail 4·0 to 4·2; tarsus 0·85; middle toe and claw 0·85 to 0·9; bill to gape 1·2.

Iris deep brown; eyelid light reddish yellow; bill reddish or reddish brown, with the nostril and tips black; legs and feet brownish red, darker at the ends of the toes, claws dark brown.

Light portion of head and upper surface cinereous ashy, finely and distinctly pencilled with brown, and the scapulars and wing-coverts richly marked with buff-yellow; centre of the forehead and crown striped with black, the feathers edged with rufescent yellow; back and upper tail-coverts pale cinereous, most of the feathers with a narrow mesial black line, and the whole finely pencilled with brown; scapulars with arrow-shaped velvety black centres, bounded by broad, rich buff margins; secondary wing-coverts with the terminal portions buff, paling to white at the edges; quills and primary-coverts dark brown, the latter, together with the secondaries, barred with reddish buff; the primaries mottled with grey near the tips, the first with a white spot on the inner web (in some with a corresponding external pale edge) and a similar one on both webs of the next three; centre tail-feathers cinereous, with narrow wavy cross bars; remainder blackish, with wavy cross lines of reddish buff, the two outer feathers with a terminal white spot (1¾ inch in depth in old birds), the tip of the lateral feather nearly always with some dark mottling and its outer margin buff.

Ear-coverts dark brown, beneath there is a narrow whitish rictal spot; a white bar across the throat, divided by a buff-mottled patch in the centre, and continued as a buff collar round the hind neck; chest with the feathers across the centre deeply tipped with pale buff; breast, flanks, and sides of belly barred with brown on a buff ground; belly and under tail-coverts whitish buff, unbarred.

Female. Length 8·4 to 8·6 inches; wing 5·6 to 5·8. Bill paler than in the male, brownish olivaceous at the base and gape; legs and feet brownish olive, claws brown.

Upper surface similar to male; quills paler, edges of primaries greyish near the tips; spots on the outer web of 2nd, 3rd, and 4th quills buff, *in some examples wanting altogether*; tail-spots not so large as in the male, about ¾ of an inch in depth, the lateral margin of the outer tail-spot sullied with brown, except in *old* birds.

Young. Iris as in adult; bill dusky olive-brown, the tip dark brown; legs and feet brownish fleshy, palest on the sides of the tarsi.

Above paler or less marked with dark brown and black than in adults; scapulars in some broadly margined with buff, in others almost uniform with the back; quills tipped with buff, the primaries apparently darker in the male than in the female; the white spots on the outer webs of the primaries more or less tinged with buff, as is also that on the inner web of the 4th quill; outer margin of the terminal tail-spots washed with buff and mottled with brown; exterior of lateral tail-feathers broadly edged and indented with buff in those birds which have richly marked scapulars.

Chin and along base of bill whitish in some, this part being, as in the adult, variable in its marking; under surface in the quite young bird fluffy, and the markings undefined in older examples; the ground-colour is greyer than in adults; under tail-coverts usually barred with brown.

Note. This species and its allies have the tarsus bare and the tail-feathers as in the last.

Obs. With age the white terminal spots of the rectrices increase in size, and the throat-band develops and becomes whiter. Examples from the dry, hot districts in the south-east and north of the island are more rufous in their tints than those from the west and south; they thus resemble Indian examples of the species, which are, as a rule, as Mr. Holdsworth remarks, *loc. cit.*, much less grey than those from the island. It must, however, be borne in mind that this Nightjar is a very variable bird in its coloration; some individuals seem to have the tendency to buff markings more exaggerated throughout the entire plumage than others, this being particularly noticeable in the scapulars and tail-feathers; the wing-spots vary considerably in character, and while the ground-colour of the primaries is almost black in one bird, it will be a medium brown in another of the same age.

Distribution.—This little Nightjar inhabits, in considerable numbers, all the maritime portions of the island, affecting, by choice, those localities where sandy scrubs or sparsely clothed open lands border the sea-coast; it is consequently less common in the damp wooded district of the south-west than in the hot eastern and northern divisions of the island. It is very abundant in the Batticaloa, Hambantota, and Trincomalie districts, and likewise in the Jaffna peninsula and down the western coast as far south as Kalatura. In the interior it is less numerous, and such wooded tracts as Saffragam, the Pasdun, and lower portion of the Kukkul Korale are haunted but little by it. It ascends into the Kandyan Province, and is by no means uncommon in Dumbara and Deltota and in the low-lying basins drained by the affluents of the Mahawelliganga. In Uva it ranges to a considerable altitude, and I have seen it in May as high as 4000 feet in the Fort-Macdonald district. Higher than this I have no evidence of its occurring.

Elsewhere on the continent this species, which is the commonest of the Indian Nightjars, is found throughout all India, and ranges, according to Mr. Hume, into the Himalayan mountains in the spring and summer, at which season it may be met with as high as 6000 feet. It extends into Burmah, and is common in the British Provinces there, Mr. Oates recording it as numerous in the plains of Pegu, but not in the hills. As regards India proper, I find that it is local in Sindh, having only been met with at Sehwan. In the Sambhur-Lake district Mr. Adam says it is not common, but in northern Guzerat and the surrounding plain country it is so. Mr. Fairbank notes that it is plentiful in the Deccan; it is likewise so in the southern parts of the Madras Presidency, but does not appear to occur in the hills, as Mr. Bourdillon does not record it in his list of Travancore birds, and Mr. Fairbank procured but one example of it at the base of the Palanis.

Habits.—The Common Indian Nightjar affects scrubby waste lands, low sandy jungle-tracts, cinnamon-plantations, and openly wooded country intermingled with small wood. It is a tame and familiar bird, and is better known to most people than the last species. It roosts during the day on bare ground between shrubs and sleeps soundly, suddenly getting up when almost trodden on, and quickly realighting again at a little distance off. The young brood remain with the parents for some time, and thus a little party of three or more may often be surprised roosting in close proximity to native houses. It is a well-known bird in the cinnamon-gardens of Colombo, alighting in the roads just after sunset, and on dull afternoons an hour earlier, and allowing itself to be almost driven over before it rises. Layard well describes the habits of this and the last species when he says that "the belated traveller hurrying homeward ere the last dying gleams of the setting sun fade in the west, is startled by what seems to be a stone flying up with a few rapid querulous notes, and gliding along on noiseless pinions settling again within a few yards of him." It is a very noisy bird at sunset and before daybreak, uttering its notes likewise on moonlight nights, although it is quite silent in darkness. Its well-known note, persistently repeated for a long time together, is wearisome when heard around one's bungalow at midnight, and many liken it, both in India and Ceylon, to the sound made by a stone scudding along ice. It resembles somewhat the sounds *chuk-chuk-chuk chuk-urrr-ruk*; but some liken it, according to Jerdon, to the syllables *tyook-tyook-tyook*. However this may be, the peculiar note has given rise to its name "Ice-bird;" and not unappropriate it is too, notwithstanding that the idea does not assimilate well with a temperature of 84° Fahr.! Its flight is buoyant and skilful, enabling it to capture its coleopterous prey with great ease. It feeds more on beetles than moths, and some say that the singular pectination of the middle claw is adapted by nature for the removal of beetles' claws from its gape. This species usually settles on the ground; but I have several times seen it perched on stumps, like the preceding.

Nidification.—The breeding-season on the western side of the island is during the first three or four months of the year. It lays usually two eggs on the bare ground, often without any depression or nest-formation; but the shelter of a bush or stump is generally chosen. The eggs are ovals in shape and smooth in texture, of a light salmon or reddish-grey ground-colour, marbled slightly and blotched openly throughout the surface with sienna-red over faint clouds of bluish grey. An egg obtained in the cinnamon-gardens measured 1·12 by 0·73 inch; but in 'Nests and Eggs' the average is given at 1·04 by 0·77 inch. The eggs are much more salmon-coloured than those of the last species and smaller. In India this species breeds chiefly in April and May, but its eggs have been taken in July; and Captain Butler is of opinion that it lays twice in the year, he having shot a hen bird, in company with a young one just fledged, on the 20th of July, and found, on dissecting her, that she was about to lay again. It is said not to be so particular in choosing its situation as other Nightjars. Mr. R. Thompson, as quoted by Mr. Hume, says that he has found the eggs "in a quite unsheltered spot in the middle of a dry pebbly *nullah*."

Order PASSERES.

Primaries usually 10, in one section only 9; greater coverts arranged in a single row, not reaching beyond the middle of the secondaries; rectrices usually 12, rarely 10. Hallux stout, furnished with a larger claw than the other toes.

Sternum with a single notch at each side of the posterior margin.

Sect. A. Turdoid or Thrush-like Passeres*. *Wing with* 10 *primaries, the* 1st *reduced in size.*

Fam. CORVIDÆ.

Bill without a distinct notch in the tip of the upper mandible; stout and straight in most genera, curved in some. Wings variable. Legs and feet stout, the tarsus strongly scutate. Hind toe very strong, claws well curved.

Sternum broad, the keel rather high, the posterior edge with a wide deep notch in each half near the side.

Subfam. CORVINÆ.

Bill more or less long and straight, stout, and the culmen high and much curved, an obsolete notch near the tip of the upper mandible. Nostrils placed in a deep depression, and protected by an impending tuft of bristles.

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* The system of classification of the great Order Passeres which I shall follow in this work will be that of Mr. Wallace, as drawn up in 'The Ibis' for 1874, with such modifications adopted by Mr. Sharpe in the 'Catalogue of Birds' as seem to me justified by my own personal experience.

Genus CORONE.

Bill very stout, straight, the culmen very high, and curved from the base, the ridge keeled. Nostrils round, concealed by overlying bristly plumes. Wings long and pointed, the 3rd and 4th quills much exceeding the 2nd and 5th; the 1st about half the length of the 3rd, and longer than the outer secondaries, but shorter than the innermost. Tail moderate and rounded. Legs and feet stout; the tarsus longer than the middle toe and claw, and protected by strong transverse scutæ. Toes strongly shielded, lateral ones nearly equal.

CORONE MACRORHYNCHA.

(THE BLACK CROW.)

Corvus macrorhynchus, Wagler, Syst. Av. *Corvus*, sp. 3 (1827); Hume, Stray Feath. 1877, p. 461; id. ibid. (B. of Tenasserim) 1878, p. 660.

Corvus levaillanti, Less. Traité, p. 328 (1831); Holdsw. P. Z. S. 1872, p. 460; Hume, Nests and Eggs, ii. p. 411; id. Str. Feath. 1874, p. 243; Ball, ibid. p. 418; Hume, ibid. 1875, p. 143.

Corvus culminatus, Gray, Cat. Mamm. &c. Nepal Coll. Hodgs. p. 102 (*nec* Sykes) (1844); Blyth, Cat. B. Mus. A. S. B. p. 89 (1849); Kelaart, Prodromus, Cat. p. 124 (1852); Layard, Ann. & Mag. Nat. Hist. xiii. p. 213 (1854); Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 553, in pt. (1856); Jerdon, B. of Ind. ii. p. 295 (1863); Legge, Ibis, 1874, p. 23, et 1875, p. 398.

Corvus sinensis, Moore, Cat. B. Mus. E. I. Co. ii. p. 556 (1856).

Corone levaillanti (in pt.), Sharpe, Cat. Birds, iii. p. 39 (1877).

The Indian Corby, *The Bow-billed Corby*, *The Indian Raven* (of some) in India.

The Carrion- or Jungle-Crow in Ceylon.

Dhar, Hind. in the north; *Dheri-kowa*, Hind. in the south; *Dad-kag*, Beng.; *Kaki*, Telugu; *Ulak*, Bhotias.

Kaka or *Goyegamma kaka*, lit. "High-caste Crow," Sinhalese; *Kaka*, Ceylonese Tamils.

Adult male. Length 17·0 to 19·5 inches; wing 11·5 to 12·3; tail 6·75; tarsus 2·1 to 2·2; mid toe 1·3 to 1·35, its claw (straight) 0·6; bill to gape 2·0 to 2·2; culmen 1·9 to 2·1. In this species the culmen is much arched.

Female. Length 16·5 to 18·0 inches; wing 10·75 to 11·5.

The smallest birds are from the south of the island.

Iris hazel-brown; bill, legs, and feet black.

Entire plumage black, highly glossed on the scapulars, wing-coverts, and rump with purple; outer webs of the tail-feathers glossed in a less degree with the same; feathers of the throat and breast more or less illumined with steel-blue reflections.

The throat-feathers are stiff and furcate at the tips.

Obs. The Ceylon Crow is the *smallest* race of the species, upon which Wagler bestowed his title of *macrorhyncha* (*cf.* Sharpe, Cat. B. iii. p. 38), and which is spread over a great part of Asia and its archipelago, culminating in the very large form inhabiting Japan, which is named *japonensis* by Bonaparte. In Malacca and the Malayan archi-

pelago it is of medium size, and exhibits the peculiar character of white bases to the feathers of the body; passing round into India it gradually decreases in size southwards towards Ceylon, the white bases becoming scarcer until, in the latter locality (as far as I can judge from a small series), they disappear altogether; while stretching northwards through China and Eastern Siberia to Japan, it increases in bulk and also again loses the white-based feathers. Our bird has usually been styled *C. levaillanti*, in common with that from South India; but in accordance with the results arrived at by Mr. Hume on an examination of an immense series of examples from India, Burmah, and Malacca, as well as by myself from an inspection of a number of specimens from a still wider range, in the British Museum, I do not see the propriety of separating it from the Malaccan species. Mr. Hume, in his exhaustive notice of this bird in 'Stray Feathers,' 1877, p. 461, shows that the characteristic of the white bases to the body-feathers is not of much value, as it is found in Indian examples and is absent in some from Malacca. He, moreover, remarks that this character is not constant in the same bird, as in some specimens the bases of the mantle-feathers were of one colour and those of the rump or the breast of another. I would surmise, in passing, that these were not fully adult birds, which would eventually have acquired the white bases throughout. As regards size, Mr. Hume's tabulation of seventy specimens shows that the wing in males from Malacca, Pegu, and the Andamans varies from 11·7 to 13·5, and in the Indian race as far south as Ootacamund from 11·5 to 14·0 (the latter dimension being, however, very exceptional, and that of an example from Cashmere). In Ceylon, as will be seen above, it diminishes still further. The Andaman birds are characterized by their length of bill; the culmen of one measured by Mr. Hume was 2·85 inches, and the length of another, from gape to tip, examined by myself, 2·5; the latter had the wing 13·3 inches, and the bases of the body-feathers white; the smallest bill in the series in question was 2·15 along the culmen. One example from Fokien, in the British Museum, has the wing 13·8, and the bases of the feathers the same as in Ceylon specimens; the wing-coverts and secondaries have the same amount of purple reflection: one from Sumatra, wing 12·75, bill to gape 2·3, white bases to body-feathers; another from N. India, wing 14·0, bill 2·3, feathers whitish at the base; one from Timor and another from India are greyish white at the base of the body-feathers, but the first-named has the bill very long, 2·6 to gape. Two from Japan have wings 14·16 and 15·0, bills 2·75 and 2·85 to gape; the wing-coverts in these are a richer purple than in any others. The tint of the hind neck varies: in some it has a greyish-green hue; but this is not constant in any locality, and a specimen from Nynee Tal is identical with one from Ceylon in this respect.

Concerning the coloration of the bases of the clothing-feathers in our birds, I am unable positively to say whether it is ever found to be white, as I did not procure a sufficient series to form an opinion; in one example some of the feathers have a tendency to a light greyish hue about the base, the others being pale brownish. I commend this subject to future workers in Ceylon ornithology. The tendency with Malayan birds to exhibit white bases to the feathers may be analogous to the grey plumage in the Hooded Crow of Europe (*C. cornix*), which freely interbreeds with the black form, and is, according to the opinion of many writers, a mere variety of the latter.

Distribution.—The Black Crow is very abundant in Ceylon, being found throughout the whole island, but chiefly in the interior, with the exception of the coast between Kalatura and Hambantota, along which it replaces the next species as "a citizen" of the towns and villages there. At Colombo it is common in the cinnamon-gardens, but does not come into the bazaars and streets of the town. Some miles to the south of that place it commences gradually to inhabit the cocoanut-lined coast, until it becomes common along the above-mentioned strip. It is very numerous throughout the whole interior, being found in the forest as well as in the open regions, in which latter it locates itself principally near native villages. In the Central Province it is common up to 2000 feet, frequenting the towns of Kandy, Gampola, Matale, &c.; above this altitude its numbers materially decrease, and it seldom ranges above 4000 feet. It has, however, been reported of late years several times to have visited Nuwara Elliya for a few days, departing as suddenly as it came.

Jerdon writes as follows concerning this bird's distribution:—"The Common Carrion-Crow of India is found throughout the whole country, from the extreme south to the Himalayas, as far west as Cashmere, and eastwards it occurs in Assam, Burmah, and the Malayan peninsula. . . . . In the south of India, as at Madras, the Nilghiris, and elsewhere, it is almost as familiar and as impudent as the Common Crow, but towards the north it is perhaps less seen about towns and villages." Mr. Ball remarks that in Chota Nagpur its distribution is somewhat capricious, and its presence or absence in particular tracts it is not always easy to account for. It occurs as high up in the Himalayas as Mussoorie throughout the year; and Mr. Hume records it from Simla. In Pegu it is common away from large towns (*Oates*), and southward of this it extends through the peninsula to Malayana, where it has been found in Java, Sumatra, Borneo, Flores, Timor, and Bali (*Sharpe*, Cat. Birds). It occurs, according to Mr. Davison, all over the Andamans, including the uninhabited islands;

but in the Nicobars it is only found in Camorta and Trinkut, having been introduced into the former place from Port Blair.

From Burmah its range extends as far east as China and Eastern Siberia. Swinhoe notes it as being found throughout the former, including Formosa and Hainan; and, in its large form of *C. japonensis*, it inhabits North China and Japan. The smaller Raven, designated *Corvus culminatus* by Sykes, and kept distinct by Mr. Sharpe, has been found at Yarkand.

Habits.—This bold bird frequents native villages, some of the towns in Ceylon, pasture-lands, and other situations in open country, as well as the wildest forest and jungle of the low country. It is usually found in pairs, except when collected to feed on carrion, when large flocks come together. They are constantly in attendance on cattle and buffaloes, perching on their backs and feeding on the ticks which infest these animals. In the interior it is very destructive to poultry and young chickens and is particularly partial to eggs. Several pairs always take up their quarters during the breeding-season in the swamps and tanks where Herons and Egrets breed, and rob the nests right and left while the owners are absent. I have seen one drop into the nest of a Purple Heron, turn over the eggs, and selecting one, adroitly carry it off in his bill, in less time than it takes to write this. On two occasions I have known them to kill squirrels (*Sciurus penicillatus*), in one of which the marauder seized the animal by the tail and dashed it against the limb of a tree until it was killed; in the other, which I witnessed myself, my attention was attracted by the creature's cries, when I observed it to be doubled up, in its agony, round the bird's bill, which had transfixed its stomach, the Crow holding it firmly, without any apparent exertion. It is a bird of powerful flight, traversing wide tracts of country high in the air, and frequently mounting to considerable altitudes in its pursuit of Hawks and Eagles. In its own turn it is subject to the feeble but troublesome attacks of the "King-Crow" (*Buchanga leucopygialis*). The "caw" of this Crow is louder than that of *C. splendens*, but it has the power of modulating it and altering the tone to an extraordinary extent.

Jerdon speaks of it in India as eminently a carrion-crow, and often the first to discover a dead animal; while Mr. Ball writes of it as being a most useful guide to the sportsman as to the whereabouts of both dead and living game, for, he says, "A tiger or a bear cannot walk about in the daylight without being made the subject of some loudly-expressed remarks on the part of the Crows of the neighbourhood."

I have myself observed this inquisitive tendency in the Corby in Ceylon; and Layard remarks that though a wounded deer may retire to the most tangled brake to die, its covert is invariably revealed to the hunter by the Crows, who, congregating in small parties on the surrounding trees, patiently wait till life is extinct to begin their repast with the jackals and wild hogs.

Nidification.—The principal months for breeding are May, June, and July, most nests being built during May. The nest is placed in the fork of a top bough, often so slender that it will not admit of the eggs being safely reached; or it may rest at the bases of cocoanut-fronds, entirely concealed from sight below. It is a large structure of sticks and twigs, lined with fine roots, hair, wool, &c. The exterior is often very straggling; but the nest is very little larger on the whole than that of *C. splendens*. As remarked in a former article, it is the favourite receptacle for the eggs of the Koel, containing sometimes as many as three or four of them. The eggs are usually four in number, and much resemble those of *C. splendens*. They are long ovals, and in many cases somewhat pyriform, of a pale sea-green or light bluish-green ground, some being thickly spotted with small specks of pale brown or umber-brown over the whole surface, mingled with linear spots of the same; others have the markings much darker, larger, and more openly distributed. They vary, in general, from 1·7 to 1·58 inch in length by 1·2 to 1·7 in breadth; but Mr. Hume records one specimen as 1·95 in length, and says that in India they vary *inter se* surprisingly in size, in tone of colour, and in character of marking, and that the birds of the plains lay slightly larger eggs than those of the Himalayas or Nilghiris, the average of twenty of the former being 1·74 inch by 1·2 against 1·73 by 1·18 and 1·7 by 1·18 respectively.

CORONE SPLENDENS.

(THE COMMON GREY CROW.)

Corvus splendens, Vieill. N. Dict. d'Hist. Nat. viii. p. 44 (1816); Blyth, Cat. B. Mus. A. S. B. p. 90 (1849); Kelaart, Prodromus, Cat. p. 124 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 214; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 559 (1856); Jerdon, B. of Ind. ii. p. 298 (1863); Nevill, J. A. S. (Ceylon Br.) p. 33 (1870–71); Legge, ibid. p. 52; Holdsworth, P. Z. S. 1872, p. 460; Legge, Ibis, 1874, p. 23; Butler, Str. Feath. 1875, p. 493; Hume, ibid. 1876, p. 463.

Corvus impudicus, Gray, Hand-l. B. ii. p. 14 (1870); Hume, Nests and Eggs, p. 413 (1873); id. Str. Feath. 1873, p. 206; Adam, ibid. p. 386; Ball, ibid. 1874, p. 418.

Corone splendens, Sharpe, Cat. B. iii. p. 33 (1877).

The Indian Hooded Crow, Kelaart; *The Common Indian Crow*, Jerdon.

Kowa, *Patti-kowa*, *Desi-kowa*, Hind., in various districts; *Kag* or *Kak*, Beng.; *Manchi-kaki*, Telugu; *Nalla-kaka*, Tam. (Jerdon).

Karavi-kaka, lit. "Low-caste Crow," Sinhalese; *Kakum*, Ceylonese Tamils; *Gráya*, Portuguese in Ceylon.

Adult male and female. Length 15·75 to 17·0 inches; wing 10·0 to 11·0; tail 6·0 to 6·5; tarsus 1·9 to 2·0; mid toe 1·4 to 1·5, claw (straight) 0·5; bill to gape 1·9 to 2·0. This species is as variable as the last in size, but females average smaller than males.

Iris dark brown; bill, legs, and feet black.

Forehead, crown, chin, cheeks and throat, back, wings, and tail black; the back, wing-coverts, and outer webs of secondaries with purple, and the throat, primaries, and tail with green reflections; nape, ear-coverts, sides and back of neck cinereous grey, blending into the black of the surrounding parts, and passing on the chest into a slightly duskier hue than that of the hind neck; breast and lower parts greyish black, glossed slightly with greenish and blending into the hue of the chest; under surface of primaries, particularly near the base, pervaded with greyish.

Young. Birds of the year have the wing varying from 9·0 to 10·0 inches.

In the nest-plumage the hind neck is dull grey and the crown is pervaded with the same; the chest and under surface are of an earthy brown, and at the age of three or four months the greenish-black feathers appear on the breast.

Obs. The plumage of this Crow is subject to variation dependent on age and freshness of the feathers; in abraded plumage the hind neck becomes quite fulvous, losing the grey tint of the newly acquired feather. This character is not the result of age in the individual: birds that are in moult may be seen with grey feathers intermingled with old fulvous-coloured ones. The amount of metallic reflections present on the upper-surface plumage increases somewhat as the bird grows to maturity.

Ceylonese specimens have been said to be blacker than Indian; but I do not know whether this alleged character would invariably hold good as regards the upper surface, were an equally large series of adult examples from the two localities compared; certainly continental birds are paler on the chest, and the grey tint descends lower down than in those from Ceylon, but some examples from India will coincide as regards the hind neck with insular ones. Birds which I have examined from Nepal and Darjiling are very pale on the hood and chest. The wings of eight specimens measure respectively 11·2, 11·0, 11·4, 10·8, 10·0, 11·9, 11·0, 10·8 inches; the largest are from Nepal. Ceylonese examples compared, therefore, with the above series will be seen to be smaller than their Indian fellows; but in regard to size insular birds vary very much; one has only to look at a number of adults as they hop about in the streets to notice at once the variation in size which exists among them. Mr. Hume writes that specimens shot in the Laccadives were very dark, recalling *C. insolens*.

In Burmah is a nearly allied race or subspecies of the present, the *Corvus insolens* of Hume. It differs from the Indian bird in being blacker with a somewhat dull appearance about those parts which in the Indian Crow are

of a pale brownish grey or pale greyish white, and it has moreover, says Mr. Hume, a somewhat longer, slenderer, and more compressed bill. Examples in the British Museum resemble *C. splendens* in the back, wings, and tail, but have the hind neck, its sides, and the chest blackish grey, faintly suffused with greenish, and the upper part of the breast concolorous with the rest of the under surface, which is greenish black suffused with grey. The wings of six examples measure respectively 10·4, 9·5, 10·6, 10·2, 9·5, 10·55 inches.

Distribution.—This Crow, which is very abundant in Ceylon within its limits, is localized in a curious manner round the coast. It is found on both sides of the north of the island, following the west coast down to about Kalatura, and the east to somewhere in the neighbourhood of Arookgam Bay; beyond this, towards Hambantota, it may occur as a straggler, but certainly not in any numbers. Its cessation on the west coast under similar conditions of climate and food to those at Colombo, where it is so abundant, is most singular. The fact was first noticed by Mr. Nevill, C.C.S., in the J. A. S., C. B., 1870–71, and was at that time received by many with some little reserve. For my part, however, I very soon verified his statement on going to Galle, at which place, as likewise round the whole southern sea-board, I found it entirely absent. It is chiefly confined to towns and their immediate environs, being found in the interior only as a straggler, and even then is not met with many miles from the coast. Even at small villages on the sea, between many of its favourite resorts, it is almost replaced by its inland relative, thus appearing to congregate almost entirely where large native populations afford it an abundance of food.

Mr. Nevill, in his above-mentioned notice of this Crow, remarks that there "is no doubt that it is not indigenous to the south of the island, having been introduced by the Dutch at their various stations as a propagator of cinnamon, the seeds of which it rejects uninjured." I do not know whether there is, in the records of the former rulers of Ceylon, any thing to support this statement; but I am inclined to think, with Mr. Holdsworth, that it is the habits and inclinations of the species which prevent it from spreading into the south; being a bird of powerful flight it has been long enough in the island to diffuse itself over the whole surface of the low country, no matter in what manner it was first introduced; and the fact that it is still remarkably local goes to prove that it confines itself to districts which suit its disposition, and that probably it avoids the south-west corner of the island owing to the humidity of the climate, a cause which alone localizes so many Ceylonese species.

This well-known bird inhabits the whole of India from the south to the Himalayas; it is found in Nepal, but does not extend as far into the range as the interior of Sikhim; it is obtained at Darjiling, however, whence there are specimens in the national collection. To the eastward of the Bay of Bengal the dark race, *Corvus insolens* of Hume, replaces it, but it reappears, whether as a migrant or resident is still uncertain, in Malacca. The specimen in the British Museum from this region was purchased from Mr. Boucard, who got it from a collector who shot it himself. I do not observe any other instance of its capture in Malacca, and some further light upon its presumed existence in that country is much to be desired.

As regards the peninsula of India it extends as far to the north-west as Sindh, where it is plentiful. In Chota Nagpur Mr. Ball remarks that it is more plentiful than the preceding species, and that it usually inhabits a distinct tract of country from that bird, although sometimes found with it about towns and villages. In the south it does not ascend the hills as it does in the Himalayas; Mr. Fairbank only found it at the base of the Palanis, and it is not recorded from the Travancore ranges at all. It extends across to the Laccadive Islands, in which group Mr. Hume found it at Amini, and heard of it at one or two of the islands nearest Cannanore.

Habits.—The space allotted to me in such a work as the present is far from sufficient to describe the habits of this bold "citizen" of Eastern towns. He is gifted with as much as, if not more intelligence than any member of his sagacious family; and annoying as he is, on account of his large share of brains, he is nevertheless a most useful adjunct to the sanitary regulations of Indian towns. He thrives to a marvellous degree in all these, his prosperous condition depending mainly on his utter audacity, his entire disregard of man, his thieving propensities, and his accurate powers of observation. He devotes himself to the timely occupation of the back yard, the bungalow verandah, the barrack-square, the abattoir, and the commissariat meat-

store; or he resorts to the scene of the fisherman's occupations on the sea-beach, or the door of the native cottage at the morning hour of cooking, in all cases exactly at the opportune moment, and he is sure not to come away without his wants being satisfied. While living at Trincomalie I always found him winging his way at early morn, while it was yet dusk, in long lines to the sea-beach and to the troops' meat-store, to be in time for the dragging of the sein-net or the cutting up of the oxen; and gathering on the sands in noisy knots, or lining the branches in "cawing" rows, these skilful robbers would never miss a chance of snatching up an unguarded morsel. But it was at meal-time in the barrack-squares of Colombo that he was more particularly in his element; crowding in scores round the verandahs at the bugle-call of "dinners up," the audacious thieves waited until the tables were spread and eagerly watched for the opportunity of acquiring a midday repast. Luckless was the soldier who turned his back for an instant! From the adjacent branches to the table and back was the work of a second, and in this space of time the savoury meat had disappeared from the gunner's plate and was being discussed by half a dozen sable beaks. In the bungalow verandah the Crow proves himself a terrible nuisance; seated on the tops of the green "tats," or slyly perched on the window-sill with his head awry, he does not scruple to pounce down, and in the momentary absence of the Ayah snatch the bread from the children's hands, or dart into the nursery and upset the milk-jug on the table; or he will glide noiselessly through the breakfast-room window and in an instant pounce upon the sideboard or table, and having from afar selected the most tempting-looking cutlet or the best viand is off again before the Appu, who is laying "master's" breakfast, can, with a well-aimed blow, effectually stop the thief. The only satisfaction that "master" gets is the Appu's tale, "Sar! I go to kitchen for a minute, and that Crow take away master's breakfast." I have witnessed one of these birds come into the mess-room at Colombo, pull off the napkin that had been placed over a cold joint on the sideboard, and begin pecking away most vigorously at the meat.

Concerning the Crow's exploits in Ceylon, Layard writes as follows:—"He levies contributions on all alike: leave but your breakfast-table for a moment, and as you return the rustling of hurrying wings, the marks of many feet on the white table-cloth, the gashes in the pat of butter, and the disappearance of plantains and small viands, proclaim who have been the robbers. The old 'hopper woman' sits frying her cakes under the lonely 'pandal' of her cadjan hut, and over her, with head inclined, taking a bird's-eye view of her cookery, sits the 'caca;' and now the 'appah' (anglice 'hopper') is done, lifted from the pan, and laid on the little circular basket ready for a customer. With a grunt of satisfaction the aged crone surveys her handiwork, and drops her spoon to feel for her beloved betel-pouch: a tiresome little bit of areca-nut has got into a corner, and the old dame bends over it, unmindful of her charge; a dark figure drops from the roof, and though she is instantly on the alert and aims an ineffectual blow at the thief, the nice white 'appah' is borne off. Sometimes, however, the robber has but a poor hold on it and drops it on the red cabook road; down pounce a host of Crows that have been looking on from many a tree, and a scuffle ensues: but anxious at least to cheat them of their booty, if not to retain the damaged article for her own eating, the old woman hurries to the rescue; but this makes matters worse, the castle is defenceless, and unseen foes drop down from beam and rafter or fly in through open doors. The rice-basket is invaded, the chilli-box overturned, the dried fish stolen, and lucky is the dame if the crash of most of her little store of crockery and glass, swept to the ground and scattered in shining fragments, does not hastily recall her to her hut."

This account is by no means overdrawn, for to the natives of the bazaars the Crow is an utter pest. I question, however, whether his absence from the towns would not in the end lead to much harm, for he is a most useful scavenger, and clears the streets and back premises of every thing thrown out from the houses, which would otherwise speedily decompose in the rays of the tropical sun. Notwithstanding its utter disregard for the native (which is so great that I have seen one pounce on to a basket carried on a boy's head and seize from it a cake or a fruit), it entertains a marked respect for the white man, and stands in wholesome dread of the gun, flying off the moment a stick even is pointed at it; and so quick-sighted is it that it espies any one trying to stalk it and decamps at once, though it has not seen the gun in the enemy's hand!

At certain hours in the day these Crows assemble in large flocks and hold a noisy parlance which lasts for some time. At Colombo it was usually on the beach at the "Galle Buck," over an evening meal

on sandflies, which they are very fond of, or engaged in pranks with the hermit-crabs, that the affairs of the day seemed to be discussed. Often at midday a noisy meeting would take place on the banks of the lake, and while several dozen birds held an angry debate on some fellow Crow who was posted in the middle of the circle, others would bathe up to the thighs in the water, ducking themselves and splashing in all directions. A striking instance of the Crow's love of mischief and his innate impudence was exemplified at Colombo in his habit of annoying the unoffending little Grebes which frequented the lake; apparently for the sake of seeing them disappear under the water, he would dart down on them over and over again.

In the towns the Grey Crow invariably roosts on the fronds of cocoanut-trees, sitting close together in rows, but not settling down for the night until a considerable time has been spent in noisy discussion. It appears to feel the tropical heat at midday, taking shelter under the shadiest branches, and often panting with its bill wide open.

Nidification.—The breeding-season on both west and east coasts lasts from May until July. The nests are built in trees near human habitations, generally at a considerable height from the ground. Scarcely ever more than two are found in the same tree, and it is usual to find but one. They are placed in the fork of a tree and made of sticks lined with coir-fibre, small roots, wool, hair, or any substance which will suit the purpose; the interior is very shallow in some and moderately deep in others, and usually measures about 6 inches across. The eggs are from three to four in number and vary much in shape, although typically they are slightly pointed ovals. The ground-colour is also somewhat varied, being in some of an olivaceous bluish green, and in others of a light blue-green. Normally they are rather closely freckled and spotted with brownish grey and light brown all over, but chiefly at the large end, where there are, in some instances, a few darker brown streaks. They vary considerably in length, but not in general bulk, averaging about 1·4 by 1·06 inch, the largest that I have measured not exceeding 1·6 by 1·08 inch.

It breeds in the Himalayas up to 4000 feet; the season, *par excellence*, says Mr. Hume, "is June and July; but occasionally nests will be found earlier even in Upper India, and in Southern and Eastern India a great number lay in May." Miscellaneous material is used for the construction of the nests, particularly in the matter of lining; and Blyth speaks of some nests being exclusively composed of wires taken from soda-water bottles, which had been purloined from heaps set aside by native servants for sale.

The same variety of form and marking of the eggs is observable in Indian specimens, and the average of a large number "is 1·44 by 1·06 inch."

Genus CISSA.

Bill moderately short, stout, wide at the base; culmen well curved, the tip with a plainly indicated notch; nasal bristles short; gape furnished with short rictal bristles. Eye surrounded by a prominent naked wattle. Wings short, rounded, the 6th quill longest. Tail long and graduated. Legs and feet stout. Tarsus equal to the middle toe with its claw; lateral toes subequal.

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CISSA ORNATA.

CISSA ORNATA.

(THE CEYLONESE JAY.)

(Peculiar to Ceylon.)

Pica ornata, Wagler, Isis, 1829, p. 749.

Cissa puella, Blyth, J. A. S. 1849, xviii. p. 810; id. Cat. B. Mus. A. S. B. p. 93 (ex Layard, MS.); Kelaart, Prodromus, Cat. p. 124 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 213.

Cissa pyrrhocyanea, Gould, B. of Asia, pt. i. pl. 13 (1850, ex Licht. MS.).

Kitta ornata, Bp. Consp. i. p. 166 (1850).

Citta ornata, Licht. Nomencl. Av. p. 9.

Cissa ornata, Blyth, Ibis, 1867, p. 298; Schlegel, *Coraces*, p. 69; Gray, Hand-l. B. ii. p. 7 (1869); Holdsworth, P. Z. S. 1872, p. 461; Legge, Ibis, 1874, p. 23; Holdsworth, ibid. p. 124; Sharpe, Cat. B. iii. p. 87 (1877).

The Mountain-Jay, Europeans in Ceylon; also *Blue Jay*.

Kahibella, Sinhalese.

Ad. capite et collo undique castaneis: dorso lætè ultramarino, uropygio cum dorso postico et supracaudalibus magis cyanescentibus: tectricibus alarum omnibus ultramarinis: primario primo nigro: remigibus reliquis extùs castaneis, intùs nigris: caudâ cyaneâ, rectricibus latè albo terminatis, fasciâ subterminali nigrâ transversim notatis: subalaribus ultramarinis, interioribus cineraceis: remigibus infrà nigris, extùs castaneis, intùs versus basin rufescentibus: palpebrâ et iride sanguineis: rostro rubro: pedibus corallinis.

Adult male and female. Length 18·0 to 18·5 inches; wing 6·5 to 6·7; tail 10·25 to 10·7, outer feathers 6·5 shorter than central; tarsus 1·6 to 1·8; mid toe and claw 1·5; bill to gape 1·5 to 1·6. Expanse 20·5.

Iris light brown; eyelid deep red, orbital skin somewhat paler; bill, legs, and feet coral-red; claws reddish yellow at base, dusky at tip.

Whole head, neck, and chest deep shining chestnut; interscapulary region, lesser wing-coverts, and beneath the hue of the chest cobalt-blue, paling into light cærulean blue on the lower back, rump, and underparts; greater wing-coverts duller blue than the lesser; quills light chestnut on their outer webs, and dull black on the inner, those of the tertials overcast with blue, basal inner edges of quills rufescent grey; tail greenish blue, the edges brightest and the terminal inch white with a dividing black band chiefly developed on the inner web, the four lateral pairs of feathers with the white running up the outer edge; thighs dusky cobalt-blue.

Young. Tail in nestling plumage about 6 inches in length; feathers pointed. Iris brown, with the outer edge pale, orbital skin brown; bill dusky orange with a pale tip; legs and feet dusky red.

Head, hind neck, throat, and chest pale chestnut; back and upper breast bluish green, becoming dusky on the lower breast, with the belly albescent; lesser wing-coverts as the back; the greater coverts and quills as in the adult. At a further stage the chestnut of the head and throat becomes darker, and the back and breast more blue, but not nearly so pure as in the second year or fully adult dress.

Distribution.—The Ceylon Jay inhabits the mountains of the Central Province, including the detached Muneragala range beyond the south-eastern slopes of Madulsima, and all the peak forests which descend into the Western Province and form the northern slopes of Saffragam. Beyond this district, to the south and west respectively, it is found in the jungles of the Rakwana district, the Morowak and Kukkul Korales, and the immense forests covering the low ranges between the Singha-Rajah jungle and the Kaluganga. This latter district comprises the lower part of the Kukkul Korale and the Pasdun Korale, and the highest parts do not exceed 1700 feet. I found it in the valleys of this wild and little-known region during the rainy month of August, at an elevation considerably under 1000 feet, which leaves no doubt that it is a resident there.

Since the jungle in the Central Province has been felled to such an enormous extent for coffee-planting, the Jay has decreased very much in numbers below 4000 feet. Its chief home now is in the forests of the main range, the Nuwara-Elliya plateau, the Peak wilderness, the upper part of Haputale, and the summits of the Knuckles. In patna-jungles, however, it is always liable to be found, particularly during the boisterous weather of the S.W. monsoon, when it is driven down from the mountains above.

The Jay was first made known by Wagler, who described it in the 'Isis' for 1829, from a specimen in the Berlin Museum, to which the East Indies was assigned as the habitat.

It seems to have escaped the notice of subsequent ornithologists until Layard's time; while collecting in Ceylon he met with it, and, being under the impression that it was new to science, he gave it its appropriate synonym, *C. puella,* and transmitted his specimens to Blyth, who established the name. Layard writes of it, "This, the most lovely of all our Ceylon birds, was discovered by me along the course of a mountain stream in the jungle near Ambegamoa."

I am glad to hear that many gentlemen in the planting districts are endeavouring to preserve this handsome species, and thus prevent the disappearance of such a pleasing ornament to the woods in the vicinity of their estates. These efforts, I understand, are chiefly being made in the Dimbulla and Lindula districts.

Habits.—This beautiful bird is of a shy disposition; it associates generally in parties of about half a dozen, and passes most of its time in the branches of tall trees, searching for lizards and large beetles, and partaking of fruit of many kinds. It is, however, often met with in low underwood; and I have several times flushed it from the ground, when it flies on to low branches and speedily makes its way off. It is fond of the green lizard (*Calotes*), which I have on several occasions found in its stomach in large fragments. At early morning they roam about the forest, keeping to the tops of the trees, and following each other with a loud clanking cry, until suitable trees to feed in have been found, in which they settle down, uttering a harsh croaking note as they move from branch to branch. When feeding in underwood or on the ground I have noticed that they are usually silent and very watchful, which they have need to be, for their beautiful blue plumage quickly attracts the attention of the sportsman. It has, notwithstanding its wary habits, a considerable amount of inquisitiveness in its disposition. Layard writes thus of it:—"The last I procured fell a victim to that curiosity so characteristic of the Jays. I was creeping through some thick jungle to get a shot at a large Wood-Pigeon, when a *Cissa* flew down from some lofty trees, and, coming close to me, peered into my face. . . . . I waited until the bird had leisurely surveyed me and flown to a little distance, still watching my movements. This enabled me to shoot it." Mr. Holdsworth remarks, "They are very noisy, continually uttering a Jay-like scream, both when perched and flying. There is consequently little difficulty in finding them out when they are in the neighbourhood; but from their keeping so much to the dense jungle, I have on several occasions worked my way quietly through the bushes to within a few yards of the birds without being able to get sight of them."

The beauty of the Jay's plumage has caused it to be recklessly shot for the sake of its feathers; but in this matter people in Ceylon are no more to blame than those in Norway, South America, and Australia, who have so ruthlessly slaughtered Kingfishers, Humming-birds, and Parrakeets to satisfy a culpable taste on the part of the fair sex for the ornamentation of their hats with the feathers of many of the most lovely members of the bird creation!

Nidification.—This bird breeds during the cool season. I found its nest in the Kandapolla jungles in January; it was situated in a fork of the top branch of a tall sapling, about 45 feet in height, and was a tolerably bulky structure, externally made of small sticks, in the centre of which was a deep cup, 5 inches in diameter by $2\frac{1}{2}$ in depth, made entirely of fine roots; there was but one egg in the nest, which unfortunately got broken in being lowered to the ground. It was ovate and slightly pyriform, of a faded bluish-green ground, thickly spotted all over with very light umber-brown over larger spots of bluish grey. It measured 0·98 inch in diameter by *about* 1·3 in length.

The front figure in the Plate accompanying this article is that of a fine female example shot in the forest surrounding the Horton Plains, and the one in the background that of a young bird.

PASSERES.

Fam. ORIOLIDÆ.

Bill rather long, wide at the base; culmen curved towards the tip, which is distinctly notched. Nostrils exposed, linear in form, placed in front of the base of the bill and near the margin of the mandible. Tarsus considerably longer than the middle toe. Feet small.

Sternum narrow in front, widening posteriorly, with a deep pointed notch in each half of the posterior edge; the posterior part of the opening almost united.

Genus ORIOLUS.

Bill with the characters of the family. Wings rather long, the 4th quill the longest; the difference between the secondaries and primaries less than half the length of the tail. Tarsus stout, covered in front with broad transverse scales. Feet rather small; the lateral toes unequal, the outer one joined at the base to the inner.

ORIOLUS DIFFUSUS.

(THE BLACK-NAPED INDIAN ORIOLE.)

Oriolus sinensis, Swains. An. in Menag. p. 342 (sub *O. coronatus*).

Oriolus chinensis (*nec* Linn.), Jerd. Cat. B. S. India, Madr. Journ. 1859, x. p. 262; Swinhoe, P. Z. S. 1871, p. 374; Hume, Str. Feath. 1874, p. 477.

Oriolus indicus, Jerd. Ill. Ind. Orn. pl. 15 (1847); Blyth, Cat. B. Mus. A. S. B. p. 216 (1849); Layard et Kelaart, Prodromus, Cat. Birds Ceylon, App. p. 58 (1853); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 270 (1854); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 124; Holdsw. P. Z. S. 1872, p. 452; Blyth & Walden, B. Burm. p. 139 (1875).

Oriolus diffusus, Sharpe, Cat. Birds, iii. p. 197 (1877).

Adult male and female. Length 9·5 to 10·0 inches; wing 5·8 to 6·3; tail 4·0 to 4·1; tarsus 0·9; mid toe 0·8, claw (straight) 0·3; bill to gape 1·4, width at nostrils 0·45.

These measurements are taken from a series of examples in the British Museum; the wings of the two examples procured by Layard in Ceylon measure 6·1 and 6·5 respectively; these are now in the Poole collection.
"Iris rich blood-red; bill pinky red; legs and feet plumbeous" (*Jerdon*).

Male. Forehead, as far back as the centre of the crown, throat, entire neck, upper and under surface of body, including the upper and under tail-coverts and the underwing bright yellow, as also the lesser wing-coverts, the outer webs of the greater coverts, and the terminal portion of all but the central tail-feathers; tips of the primary-coverts and edge of wing paler yellow than the aforesaid parts, and the outer webs of the secondaries marked with the same as follows—the entire web of the innermost and those of the remaining feathers decreasing gradually to an edging on the outermost; primaries marked with a still narrower margin; lores, a space above and behind the eye, posterior part of crown, occiput, and nape, as also the wings and tail, with the exception of the parts above named, jet-black.

Female. Back and scapulars slightly tinged with olivaceous.

Young. Bill dusky or dingy pinkish.
Upper surface with the scapulars and those parts of the wing which are bright yellow in the adult dusky greenish

yellow, brightest on the upper tail-coverts; in front of the eye a small black spot; outer webs of greater coverts clear yellow, the parts of the wing which are black in the adult dark brown; sides of neck yellower than the back part; throat, chest, and breast whitish, tinged strongly with yellow on the sides of the breast, flanks, and under tail-coverts, and streaked on the fore neck and under surface of body with blackish lines, finest on the fore neck, and boldest on the breast and flanks.

Obs. Mr. Sharpe has given this species the above title, although it has generally been known by that of *indicus*, as it appears that the name given by Brisson is not admissible, inasmuch as it related to a bird which had blue in its plumage, a character not to be found in any Oriole. As it is found in China it is more widely diffused than any other Black-naped Oriole, and hence Mr. Sharpe's name for it. Linnæus's name *chinensis* is said to be referable to the Philippine bird. Examples from China differ somewhat from Indian ones in having a "slightly larger bill, a somewhat larger wing-spot, and decidedly more yellow on the tertiaries" than the latter; but Mr. Hume, whose remarks I quote, finds Tenasserim specimens to match both Chinese and Southern-Indian, thus establishing an unbroken chain.

The Black-naped Orioles form a closely allied and very interesting group. *O. tenuirostris* from Burmah, as its name implies, has a slenderer bill and has more yellow on the primary-coverts and tail than *O. diffusus*. *O. andamanensis* from the Andamans and *O. frontalis* (a splendid species) from the Sula Islands are chiefly distinguished by their black, almost unmarked wings; and the latter has the head nearly all black, with only a narrow frontal band of yellow.

O. macrurus, Blyth, from the Nicobars is another black-winged species of Black-naped Oriole with a broader occipital band than *O. andamanensis*.

Distribution.—The present species has proved to be only a straggler to the island of Ceylon, but two specimens of it having been procured as yet. Layard, who introduced this Oriole into our lists, writes of it (*t. c.*):—"A single pair of these birds fell under my notice; they were shot by a native at the back of the Bishop's residence near Colombo." It enjoys a wide range, and no doubt is much in the habit of moving from place to place, so that it may occur again at some future period within our limits.

Jerdon remarks that it is spread more or less throughout India, but is rare everywhere; he procured it in the Malabar jungles. Mr. Elliott found it at Dharwar, and it occurs near Calcutta; it is, however, as Jerdon says, much more common in the countries to the east of the Bay of Bengal, extending southwards into the peninsula of Malacca as low down as Pinang. Mr. Hume records it from Tenasserim, in which province Mr. Davison procured it south of Moulmein. It is spread eastward from Burmah as far as China, where Swinhoe remarks of it as follows:—"Throughout China, and Formosa in summer. Resorts in winter to Cochin-China, Tenasserim, and India." It would appear from this that it is merely a visitant to India, a fact which would well explain its being a casual straggler to the shores of Ceylon. As it is a summer inhabitant of China, it probably breeds there, and that country may be considered to be its proper headquarters.

Habits.—But little is recorded concerning the habits of this Oriole. It appears in India to frequent forest-districts, and to keep more to jungle than most other species of its family. It is evidently a bold bird, and well able to hold its own in the forests. Mr. Swinhoe, in writing on the ornithology of Formosa in 1865, gives the following account of its prowess:—"Walking along the avenue this morning, my attention was attracted by a Halcyon's scream, and two birds, one chasing the other, dashed through the thicket. The first bird I was not quick enough to catch sight of. The pursuing bird was an Oriole (*Oriolus chinensis*). The Oriole discontinued the chase, and, perching on a tree not far from me, began to whistle its absurd attempt at a song, as if glorying in the defeat of its enemy. It was a mature bird, and looked very showy in the sunlight." The diet of this species is probably of a mixed nature, as is the case with many of its congeners, who are both insectivorous and frugivorous.

I know nothing of its nidification.

ORIOLUS MELANOCEPHALUS.

(THE BLACK-HEADED ORIOLE.)

Oriolus melanocephalus, Linn. Syst. Nat. i. p. 160 (1766); Blyth, Cat. B. Mus. A. S. B. p. 215 (1849); Kelaart, Prodromus, Cat. p. 122 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 123; Horsf. & Moore (in pt.), Cat. B. Mus. E. I. Co. i. p. 269 (1854); Jerdon (in pt.), B. of Ind. ii. p. 110 (1863); Hume, Nests and Eggs, ii. p. 301 (1874); id. Str. Feath. 1874, p. 230; id. *t. c.* (1878) (B. of Tenass.), p. 330.

Oriolus ceylonensis, Bonap. Consp. Av. i. p. 347 (1850); Jerdon (in pt.), B. of Ind. ii. p. 111 (1863); Holdsw. P. Z. S. 1872, p. 453; Hume, Str. Feath. 1873, p. 439; Fairbank, ibid. 1877, p. 406; Sharpe, Cat. Birds, iii. p. 216 (1877).

The Black-headed Indian Icterus, Edwards, Birds, p. 77, pl. 77; *Le Loriot de Bengale*, Brisson; *The Southern Black-headed Oriole*, Jerdon, B. of Ind.; *Mango-bird*, Europeans in Ceylon. *Pilak*, *Zardak*, Hind.; *Konda-ranga pandu*, Telugu.

Ka-kurulla, lit. "Yellow-bird," Sinhalese; *Mamkoel*, *Mambala kuruvi*, Tamils in Ceylon.

Adult male. Length 9·5 to 10·0 inches; wing 5·0 to 5·2; tail 3·2; tarsus 0·9 to 1·05; middle toe and claw 0·95 to 1·0; bill to gape 1·25, width at nostrils 0·37.

Iris bright ruby-red; bill faded lake-red, paler about the base beneath; legs and feet dusky bluish, claws dusky.

Entire head, hind neck, throat, and fore neck down to the centre of the chest shining jet-black; wings and a patch on the centre of the four middle tail-feathers black, less lustrous than the head; rest of upper and under surface, wing-coverts, upper and under tail-coverts, tail and under wing rich yellow, with a *slight* greenish tinge on the back and rump; tips of the primary-coverts, varying from 0·3 to 0·5 inch in depth, tips of the secondaries, varying on the outer webs of the innermost feathers from 0·3 to 0·6 inch in depth, bright yellow; primaries more finely tipped with pale yellow; in most specimens, except those which are evidently very old, the yellow of the central rectrices next the black is sullied with greenish; the black band varies from $\frac{3}{4}$ to 1 inch in width on these feathers. In some examples the outer web of the *shortest* secondary feather, which is almost concealed by the scapulars, is entirely yellow.

Adult female. Length 9·5 inches; wing 4·8 to 5·0. The yellow of the back and breast is less vivid than in the male. Examples not fully adult of both sexes have the back strongly tinged with greenish.

Young. The bird of the year measures 8·7 to 9·1 inches, and has a wing of 4·7 to 4·8. Iris brown; bill black or blackish brown, with the edge of the base of lower mandible light; legs and feet slightly duskier than in the adult; a yellowish stripe runs from the nostril over the eye; orbital fringe yellowish; throat white, with black mesial stripes; the wing-coverts, which are yellow in the adult, have blackish centres; tips of secondaries less conspicuous; margins of primaries whitish at the centre; tail-band brownish, very broad, and extending across all the feathers, but limited to the outer web on the two laterals; the breast striated with black, and apparently more so in males than in females; back washed with brownish. In the nestling just plumaged the head has the feathers edged greenish.

Obs. The Oriole inhabiting Southern India and Ceylon has been usually styled *O. ceylonensis*, a name given by Bonaparte to a bird with less yellow on the wing than he supposed the species described by Linnæus, under the name of *O. melanocephalus*, exhibited. Linnæus, however, founded his species on Edwards's plate of the Black-headed Indian Icterus, which is no other than a representation of the Ceylonese and Peninsular-Indian Oriole with the tertials tipped only with yellow; the spot formed by the yellow tips of the primary-coverts is, it is true, very large, and answers well to that which exists in the Himalayan bird usually styled *O. melanocephalus*. This is, however, a mistake of the artist, as is manifest by the letterpress, which runs as follows:—"The remainder of the quills next the body *are tipped with yellow, which colour extends a little way along their outer webs*; the *tips* of the covert-feathers where they fall on the greater quills are yellow, which form a distinct *spot* of yellow a little above the middle of

the wing." Now the alleged differences between Linnæus's and Bonaparte's species lie in the smallness of the wing-bar and the scanty amount of yellow on the tertials of the latter, characters which in reality, by virtue of Edwards's plate, apply to the former (*O. melanocephalus*). If, therefore, there be two races of this Oriole which deserve subspecific rank, it is the northern bird, which must be separated from the southern and receive a name, which I would propose as *O. himalayanus**, because the birds from that region principally, as I shall presently show, exhibit the characteristic on which they could alone be specifically separated.

As much has been written for and against the characters which have been held to separate the northern and southern races of this Oriole, I have carefully examined the whole series in the British Museum, and give here a Table of the results of my examination. The specific names are those used on the labels of the specimens from the localities named.

			Wing. in.	Bill to gape. in.	Wing-spot (broad). in.	Coloration of outer web of innermost *exposed* secondary.
a.	*Oriolus melanocephalus.*	N.W. Himalayas	5·6	1·32	0·7	Entirely yellow.
b.	,, ,,	Nepal	5·45	1·35	0·65	,, ,,
c.	,, ,,	N.W. Himalayas	5·4	1·45	0·45	,, ,,
d.	,, ,,	Nepal	5·65	1·3	0·7	,, ,,
e.	,, ,,	Nepal	5·7	1·3	0·62	,, ,,
f.	,, ,,	Pegu	5·4	broken	0·7	,, ,,
g.	,, ,,	Kamptee	5·12	1·35	0·4	Large spot at tip.
h.	,, ,,	Madras	5·1	1·3	0·55	,, ,,
i.	,, ,,	Madras	5·2	1·25	0·45	,, ,,
k.	,, ,,	Madras	5·4	1·3	0·5	,, ,,
l.	,, ,,	Travancore	5·61	1·35	0·75	,, ,,
m.	,, ,,	Tenasserim	5·2	1·28	0·4	,, ,,
n.	,, ,,	Behar	5·4	1·3	0·4	,, ,,
o.	,, ,,	Behar	5·5	1·3	0·6	,, ,,
p.	*Oriolus ceylonensis.*	Nuwara Elliya	5·1	1·32	0·3	,, ,,
q.	,, ,,	Nuwara Elliya	4·8	1·2	0·3	,, ,,
r.	,, ,,	Galle	5·2	1·25	0·5	,, ,,
s.	,, ,,	Nuwara Elliya	5·0	1·25	0·5	,, ,,

Examples *g* to *o* are not to be separated from the four last Ceylonese specimens; the size of the spot at the tip of the outer web of the innermost secondary, as well as the extent of yellow at the termination of the adjacent feathers, varies in each, but it is no larger in the South-Indian than in the Ceylonese series; it will also be seen that no dependence can be placed on the width of the wing-spot formed by the yellow tips of the primary-coverts, the Travancore specimen having it as wide as any Himalayan, although it must be acknowledged that it is larger as a rule in the northern form than in the southern. There is, however, a constant difference in the coloration of the long, exposed inner secondary of the Himalayan bird, which is very remarkable when seen in a series laid side by side with another from the various localities indicated in the above table; so that in the birds from the region above mentioned, in addition to the secondaries having more yellow at the tips than others, there is the fact that the feather in question has always (as far as I can judge from the series examined) the entire web yellow, while others (the true *O. melanocephalus*) have merely a large spot at the tip of the outer web. In most families of birds it would amount to an absurdity to base a separation of two species on the coloration of a single feather; but in the Orioles, which depend so much on the distribution of the yellow for their specific rank, it may not seem an unnatural point to lay stress upon. As long as the distinction which I have pointed out is found to hold good, I see no reason why the Himalayan and Pegu form should not stand as a subspecies or local race of the Indian.

Distribution.—This Oriole is a very common bird in Ceylon, being found throughout the entire low country and the hills, ranging up to an altitude not unfrequently of 6000 feet. It has, indeed, on several occasions been found at Nuwara Elliya; and in Uva, where it is very common, it often occurs at 5000 feet. In the north it is numerous, inhabiting the island of Manaar and those adjacent to Jaffna, as well as the extreme north of the mainland; and in the dry forests of the north-central district, in the Seven Korales, and interior of the Eastern Province it is likewise common. In the west and south it is chiefly found in

* *Oriolus melanocephalus*, Sharpe, Cat. B. iii. p. 215 (*nec* Linn.).

the cultivated portions of the interior and on the sea-board, and in the Galle district retires inland during the rains of the south-west monsoon. In the arid country between Haputale and the sea it is mostly confined to the forest on the rivers. On the Kandy side it is noticeable chiefly in Dumbara and the open valleys through which flow the numerous affluents of the Mahawelliganga.

In India this species is found throughout the greater part of the peninsula from Bengal southwards. Jerdon writes of the race which he styles *O. ceylonensis,* that it is found in Southern India, being common on the Malabar coast, comparatively rare in the Carnatic, and almost unknown in the bare Deccan. On the western confines of this district, however, it has been found by Mr. Fairbank, who records it from "Konkan and the western declivities of the Sahyadris, from Khandola to Goa." There are specimens in the British Museum from Madras, where it is said to be common. As the examples above cited from Behar belong to this species it may be presumed that the Oriole which Mr. Ball says is common in Chota Nagpur belongs to the scantily marked form and not to that which inhabits the sub-Himalayan region. Passing over Pegu, in going eastward of Bengal, we find it again in Tenasserim, whence comes one of the specimens enumerated in the above table. Mr. Hume says that it "extends through the Province as far south as Mergui, but is rare south of Tavoy." I conclude the birds spoken of are the same as the example cited. In the Andamans Mr. Davison says it is a seasonal visitant, leaving them in October and returning in March.

Habits.—This showy bird, which is one of the ornaments of Ceylonese cultivated nature, frequents open paddy-lands studded with woods, detached groves, wooded compounds, the interior of forests in the dry parts of the island, and the borders of rivers and large tanks. Being a tame species, it dwells much in the proximity of houses, and remains perched sometimes on the top of a prominent tree, repeating its well-known note, *ko-ko-wak,* which it also utters on the wing. It has considerable powers of flight, progressing with alternate beating and closing of the wings. Its food consists chiefly of fruits and seeds of jungle-trees, and it consumes largely the berries of the Lantana. The Oriole is almost universally styled the "Mango-bird" by Europeans on account of its yellow plumage; but I imagine the name was imported from India in the first instance. It is a well-known species in the western parts of the island to sportsmen, and often pays with its life the penalty usually imposed upon the unfortunate members of the feathered creation who, unhappily for themselves, are arrayed in more gorgeous dress than their fellows. The first shot fired in the dawn at the much sought after "Kaswatua"* usually arouses the Oriole, and cuts short the morning preening of his yellow dress, frightening him across the misty paddy-field, out of which the Snipe are getting up before the sportsman's gun. When thus frightened it does not fly far, but quickly settles in some thickly foliaged tree and gives out its not unmelodious whistle. It is not a sociable bird, although two or more are often seen not far from each other, and occasionally I have aroused a pair from the same tree.

Concerning its habits in India Jerdon writes:—"It frequents both forests, gardens, and groves. It is a lively and noisy bird, constantly flying from tree to tree, and uttering its loud mellow whistle, which Sundevall has put into musical form. It feeds chiefly on fruit, especially on the figs of the Banian, Peepal, and other *Fici,* and it is said also to eat blossoms and buds."

Nidification.—The "Mango-bird" breeds, on the western side of the island, during the first six months of the year, the favourite time being March and April. In the north-east I have found its nest in December. It builds at the fork of a horizontal branch some distance out and high above the ground, suspending its nest by twining the material of the top round the branches. The nest is variable in construction, but is generally large and loose, composed of grass, bark, and small twigs, ornamented with lichens and bleached leaves. The eggs are usually three in number, pointed ovals in shape, and some so much so that they might be called pyriform; the texture is smooth and the ground-colour pinkish white, sparsely spotted and blotched with openly distributed smooth-edged markings of reddish brown, umber, and purplish black. In some eggs the markings are more confined to the large end than in others, and in one or two I have seen sundry hieroglyphic-like spots. Mr. Hume remarks, in 'Nests and Eggs,' that "the dark spots are not unfrequently more or less enveloped in a reddish-pink nimbus." The average dimensions are 1·2 by 0·82 inch.

* Native name for Snipe.

PASSERES.

Fam. CAMPOPHAGIDÆ.

Bill generally stout, moderately hooked and moderately notched; generally thick at the base, rather widened; the nostrils hidden. Wings in most species lengthened, never short.

Shrike-like birds of soft plumage; the feathers of the lower back and rump with stiffened shafts. (*Sharpe*, Cat. Birds, iv. p. 7.)

Genus GRAUCALUS.

Bill stout, massive, wide at base; culmen keeled and much decurved, with the tip notched distinctly. Nostrils covered with setaceous feathers; rictal bristles moderate; the lores bristly. Head massive. Wings long; the 4th quill the longest, and the 1st less than half the length of the 4th. Tail tolerably long, and slightly graduated at the exterior. Tarsus longer than the middle toe. Feet strong, claws curved and strong.

GRAUCALUS MACII.

(THE LARGE INDIAN CUCKOO-SHRIKE.)

Graucalus macii, Lesson, Traité, p. 349 (1831); Blyth, Cat. B. Mus. A. S. B. p. 190 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 173; Jerdon, B. of Ind. i. p. 417 (1862); Blyth, Ibis, 1866, p. 368; Hume, Nests and Eggs, i. p. 181 (1873); Walden, Ibis, 1873, p. 310; Hume, Str. Feath. 1874, p. 204; Adam, *t. c.* p. 400; Hume, Str. Feath. 1875, p. 94; Butler, *t. c.* p. 464; Blyth & Walden, B. Burm. p. 123 (1875); Armstrong, Str. Feath. 1876, p. 316; Hume, ibid. 1877, p. 29; Fairbank, *t. c.* p. 400; Hume & Davison, ibid. 1878, p. 210; Sharpe, Cat. Birds, iv. p. 34 (1879).

Graucalus nipalensis, Hodgs. Ind. Rev. i. p. 327.

Campephaga macei (Less.), Gray, Gen. B. i. p. 283 (1845); Kelaart, Prodromus, Cat. p. 123 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 128.

Graucalus layardi, Blyth, Ibis, 1866, p. 368; Jerdon, Ibis, 1872, p. 117; Holdsw. P. Z. S. 1872, p. 437; Wald. Ibis, 1873, p. 311; Hume, Stray Feath. 1873, p. 435; Legge, Ibis, 1875, p. 287.

Mace's Caterpillar-catcher, Kelaart; *The Large Caterpillar-catcher. Kasya*, Hind.; *Kabasi*, Beng.; *Pedda akurai*, Tel., lit. "Large File-bird."

Adult male and female. Length 10·1 to 10·4 inches; wing 5·8 to 6·05; tail 4·3; tarsus 1·0 to 1·1; mid toe 0·85, claw (straight) 0·39; hind toe 0·5, claw (straight) 0·35; bill to gape 1·3 to 1·4. These measurements are from a good series of Ceylonese examples, in which the females average the larger of the sexes.

Iris reddish brown, variable in intensity of colour; bill black; legs and feet black, edges of tarsal scales whitish.

Male. Above the nostril, lores, round the eye, and the gape and point of chin jet-black, passing into blackish on the ear-coverts. The feathers of the lores are bristly. Above slate-grey (individuals varying in depth of colour), paler on the forehead and rump, which latter part is indistinctly barred with white; head and back in some examples with dark shafts; wing-coverts duskier than the back and with dark shafts; wings and tail black, the former

with the quills edged white, and the outer webs of the tertials and secondaries paling into grey towards the edge; central rectrices dark grey, and the whole tipped white, the two external pairs mostly so, and the white extremity passing up into the grey.

Throat, sides of neck, chest, and upper breast slate-grey, lighter than the upper surface, and paling on the breast gradually into the white of the lower parts, leaving a few *very faint* traces of barring on the sides of the breast; under tail- and under wing-coverts white, the edge of the wing with a few light bars of bluish grey; thighs slate-grey, the edges of the feathers more or less edged with white. The generality of adult examples have a not inconsiderable amount of light barring on the lower breast.

Adult female. In this sex the lores are less black than in the male, as also the space beneath the eye and the ear-coverts, and the upper surface is not so blue; the very old bird has the under surface as in the male.

Young. The nestling, as described by Mr. Hume from the Andamans, has the lores, cheeks, and ear-coverts pale grey, each feather tipped with fulvous; the head and hind neck greyish white, tipped and margined with pale fulvous; back and scapulars French grey, tipped fulvous, and with a subterminal dusky spot on the feathers; the secondaries, tertiaries, and greater and median wing-coverts greyish brown, very broadly margined on the outer webs with creamy white; the primaries margined and tipped with fulvous; chin, throat, and breast greyish white, the feathers tipped and margined with pale, slightly fulvous white; the lower parts pure white and unbarred.

The immature male has the chest and centre of the breast barred on a bluish-grey ground with dark slate-grey bars, which extend to the lower flanks and borders of the abdomen; the throat and fore neck are uniform grey, as in the adult; lores black.

The female has the throat whitish, the ground-colour being pervaded with grey, which changes into white on the chest, and the whole under surface, from the chin to the lower breast and flanks, barred with dark grey: with age the throat and fore neck gradually assume a uniform appearance as the light interspaces darken; in an example before me in this stage the barring is just perceptible on the throat, and the breast is white crossed with dark grey bars.

Obs. The Ceylonese and South-Indian race was separated by Blyth (*loc. cit.*) as *G. layardi*, without further diagnosis or description than that it was of the same small size as *G. javanensis*, and had the anterior surface of the wing underneath strongly barred, and the outer tail-feathers very slightly white-tipped. The first-named feature in the plumage refers to an immature bird, and the latter is a variable character. Ceylon birds certainly, as a rule, are smaller than those from the Andamans, Burmah, North-east India, and many parts of the Peninsula, but in the south of the empire they vary in size. One example from Coorg, tabulated by Lord Tweeddale ('Ibis,' 1873), has the wing 6·0 inches, while another in my own collection from the island of Ramisserum measures 6·5 inches. Mr. Sharpe, moreover, finds that North-west Indian specimens are intermediate in size between Himalayan and Ceylonese; in fact there is one in the British Museum from Kattiawar measuring only 6·0 inches, another from Kamptee 6·4, and a third from Mahabaleshwar 6·3; while a specimen from Mysore is again as large as a North-Indian one—wing 7·1, bill to gape 1·35. Three Maunbhoom specimens, recorded by Lord Tweeddale, measured 6·37, 6·6, and 6·3 in the wing. An Andaman female in my own collection has a length of 6·9; and one from Dehra Doon is noted at 7·37. These data show, therefore, that there is great variation in size in this species, and that while the largest birds come from the sub-Himalayan districts and the Andamans, those from N.W. India and Ceylon (widely separated regions) are nearly alike in dimensions; and these latter are, as regards plumage, when compared with the larger examples of the same age, identical with them.

Distribution.—This fine bird is generally distributed throughout the northern forest-tract from the country lying to the north-east of Trincomalie to the limit of the dry district a little south of Chilaw, likewise throughout the eastern portion of the island (where it is more particularly found about the dead trees in the newly-restored tanks) and the arid jungles between Haputale and the south-east coast. In the Kandyan Province it inhabits Uva pretty generally and the district round Kandy, including the Knuckles and the valleys of the southern affluents of the Mahawelliganga flowing through Hewahette and Maturata. Mr. Bligh has procured it also in Kotmalie, which is on the other side of the Pusselawa range. Among the above-mentioned districts it is especially numerous in the Wellaway Korale and the wild jungles lying between Anaradjapura and Chilaw.

Concerning its general distribution in India, Jerdon writes that it is found over the whole country, from the Himalayas to the extreme south, wherever there is a sufficiency of wood. Its location in the north-west is

somewhat peculiar, for Captain Lloyd says it is common in Kattiawar. Captain Butler observes that it is the reverse in the Guzerat district, for he only saw it near Deesa and in one or two other parts of the plains; while Mr. Hume writes that it has not been recorded from Sindh, Cutch, Jodhpore, or Sambhur. In Chota Nagpur it is, says Mr. Ball, pretty generally distributed; in the Khandala district it is found everywhere, but is nowhere abundant. Mr. Fairbank records one specimen as seen in the Palani hills; and Mr. Hume has received it from Anjango, and myself from Ramisserum Island. Turning towards the north-east we have it not uncommon along the bases of the Himalayas, and procured at such places as Dehra, Kumaon, Gurwhal, and Darjiling; further east still, Mr. Inglis says that it is very common in Cachar during the cold season, being met with there in flocks, but that it is only occasionally seen during the rains. In the Irrawaddy delta Mr. Armstrong met with it in abundance; and Mr. Oates writes that it is common within the limits of Upper Pegu and also in the Arracan hills. In the northern portion of the province of Tenasserim it is also not uncommon, extending thence across the bay to the islands, where it inhabits those of the Andaman group and is a permanent resident in them.

Habits.—The large Cuckoo-Shrike is decidedly a shy species. In the immature stage chiefly it associates in small flocks or troops, which keep in scattered company among tall trees near forest-lined rivers or surrounding the wild tanks of the Northern Province. Single birds are often met with flying high in the air and uttering their shrill call, *kur-ēēch,* sometimes suddenly darting down in their course and alighting on the top of a lofty tree, on which they will continue this harsh and far-sounding note. When in small troops, if disturbed, one bird will leave the tree and is then followed by its mates one after the other, who pursue their companions to a new perch and again settle down in company with them. It is consequently difficult to approach within shot, and is usually only procured when it happens to alight by accident in a tree near the position of the sportsman or collector. Though not loud its note is very harsh and peculiarly far-reaching; it is in the evenings that it is peculiarly fond of uttering its dis-syllabic cry, and it will remain for some time perched in the same spot, now and then, in the breeding-season, giving out a low chirping song. Its food consists of caterpillars, grasshoppers, and various kinds of coleopterous insects. Hodgson states its food to be "*Mantides, Scarabæi,* berries, vetches, and seeds." I have no record, in my field-notes, of having found the diet of any example of so mixed a nature as this; but, doubtless, the food of this species is as varied as that of many Passerine birds.

Nidification.—Mr. Parker, of the Ceylon Public Works Department, who has had much opportunity of observing these birds in the N.E. and N.W. Provinces, says that they breed in June in the forests of that part, but he did not succeed in procuring their eggs.

Mr. Blewitt, as quoted by Mr. Hume in his 'Nests and Eggs,' says "that the nest is built in the most lofty branch of a tree, near the fork of two outlying twigs; it is circular in form, and the body is thickly made of thin twigs and grass-roots, while the outer part of the nest is covered with what appears to be spiders' webs; the interior is moderately cup-shaped. The breeding-time is in May and June." Jerdon found the nest in a lofty *Casuarina*-tree, and it was composed of small twigs and roots. The eggs are three in number and are rather elongated ovals, a good deal pointed towards one end; the ground-colour is greenish stone-colour, with, as Mr. Hume remarks, a creamy tinge in some. "The markings are very Shrike-like, and consist of brown blotches, streaks, and spots, with numerous clouds and blotches of pale inky purple, which appear to underlie the brown markings." Average dimensions of eight eggs 1·22 by 0·9 inch.

Genus PERICROCOTUS.

Bill not so massive as in *Graucalus*; culmen straighter and more suddenly bent down at the tip, which is plainly notched. Nostrils oval, placed in a depression concealed by the plumes; rictal bristles feeble. Wings pointed; the 4th and 5th quills subequal and longest; the 1st and 2nd in the same proportion as in the last genus. Tail long, much graduated. Legs and feet small.

Of brilliant plumage; sexes differing in coloration.

PERICROCOTUS FLAMMEUS.

(THE ORANGE MINIVET.)

Muscicapa flammea, Forster, Indische Zoologie, p. 25, pl. 15 (1781).

Phœnicornis flammeus, Swainson, Zool. Ill. 2nd ser. pl. 52 (1831); Jerdon, Cat. B. S. India, Madr. Journ. 1839, x. p. 244; id. Ill. Ind. Orn. pl. 11 (1847).

Pericrocotus flammeus, Gray, Gen. Birds, i. p. 282 (1845); Blyth, Cat. B. M. A. S. B. p. 192 (1849); Kelaart, Prodromus, Cat. p. 123 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 127; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 142 (1854); Gould, B. of Asia, pt. ix. (1857); Jerdon, B. of Ind. i. p. 420; Holdsw. P. Z. S. 1872, p. 438; Hume, Nests and Eggs, p. 182 (1873); Legge, Ibis, 1875, p. 288; Sharpe, Str. Feath. 1876, p. 208; Hume, ibid. p. 394, et 1877, p. 197; Sharpe, Cat. Birds, iv. p. 75 (1879).

Flammeous Flycatcher, Lath. Gen. Hist.; *The Elegant Red Flycatcher*, Kelaart; *Sultan-bird*, Europeans in Ceylon; *Orange red Bird*, Swainson.

Phari-Balal-chasm, Hind., Jerdon.

Gene-kurula, Sinhalese.

Adult male. Length 7·7 to 7·85 inches; wing 3·5 to 3·6; tail 3·5 to 3·6; tarsus 0·65; mid toe and claw 0·65 to 0·7; bill to gape 0·9.

Iris reddish brown; bill, legs, and feet black.

Entire head, throat, hind neck, upper part of back, wings, central rectrices, nearly the whole of the adjacent pair, and the basal half of the others black, highly glossed on the head, throat, and back; under surface from the throat downwards, under tail-coverts, the tip and terminal half of the outer web of the above-mentioned central tail-feathers, the terminal half of the rest, a band across the wing, commencing on the outer web of the 5th primary, the tips of the greater secondary wing-coverts, and an external spot near the tips of the inner secondaries fiery orange-red, most intense on the chest, tail-feathers, and upper tail-coverts; under wing-coverts and under surface of the scarlet wing-band, as also an inner marginal spot on the 3rd and 4th primaries, pale yellowish red; thighs dusky black.

Female. Smaller than the male; wing 3·4 to 3·5 inches.

Iris brown; head, back of neck, scapulars, and lesser wing-coverts dark bluish ashy; the forehead and that portion of the wings and tail which is red in the male, together with the entire under surface, primrose-yellow; the wing-spot commences on the 5th primary; lores dark grey; the yellow of the forehead produced above the eye; quills and tail dusky blackish; rump and upper tail-coverts greenish yellow, blending into the hue of the back.

Young. Iris brown.

Immature males are clothed in the garb of the female. A specimen in my collection assuming the adult plumage has the head, hind neck, back, and wing-coverts bluish grey, intermingled with black feathers; throat yellow, mixed

with black; under surface bright yellow, with orange feathers appearing on the chest; rump greenish yellow, with the upper tail-coverts orange-red; part of the wing-bar is yellow and part orange-red, and the same with the spots on the inner secondaries; the wings and central tail-feathers are black, and the pale portions of the tail yellow.

Obs. Mr. Hume gives the measurements of the wings of a series of males from South India as varying from 3·6 to 3·75 inches, and of females from 3·45 to 3·7. These, it will be seen, exceed the usual size of Ceylonese individuals. Two examples in the British Museum, from Travancore and Madras respectively, measure in the wing 3·5 and 3·6, and they have the wing-spot extending as far as the 5th primary; there is another, collected by Captain Elliott, the locality unknown, with the spot extending upon the 4th primary, but it does not reach across the web from the margin quite to the shaft. The northern species (*P. speciosus*), which inhabits the eastern portion of the slopes of the Himalayas as far as Western Bhotan and also Central India, and the eastern and smaller race of that bird, which inhabits Burmah and Assam (*P. elegans*), are allied to the present. The former is a larger bird than *P. flammeus* (wing, ♂, from 4·0 to 4·3), and has the wing-band extending further out than in the latter—that is to say, the first *two* primaries only, according to Mr. Hume, in the male, and the first *three* in the female and young male want the bright patches on the outer webs. The female is of a more orange hue than that of the present species. Mr. Hume speaks of it as follows:—"Is a clear full gamboge- or orange-yellow below, the orange of the forehead extending over the anterior half of the crown, and sometimes further." The wing in *P. elegans* is similarly marked; but the outer webs of the central tail-feathers are red, whereas in the larger form they are wholly black, as in *P. flammeus*.

Distribution.—This conspicuously-plumaged bird is found in most of the forests and wild jungles of Ceylon. It is numerous in the coffee-districts of the centre and south of the island and in the main range, including the Horton Plains, in the woods of which it was one of the commonest birds I saw there during the month of January. Among other places in the Kandyan Province where it is frequent is the Knuckles district. It is found pretty generally in the forests between Colombo and Saffragam, in the Pasdun Korale, and in the wild country on the banks of the Gindurah from Baddegama up to the Singha-Rajah forest. In the jungles of the flat country lying between Haputale and Kattregama, in the Friars-Hood hills, and in the interior of the northern portion of the island it may always be met with where the trees are large and shady. Mr. Parker tells me it is very common at Uswewa, near Puttalam. It is not found in the Jaffna peninsula, as far as I am aware—its northernmost limit being fixed by Layard at Vavonia Velankulam; as there is, however, much heavy forest north of that place, I am of opinion that it will be found between it and "Elephant Pass."

On the mainland this Minivet is confined to the south of India. Mr. Hume thus sketches out its distribution (Str. Feath. 1877, p. 198):—"It is essentially a bird of the hills of Southern India. . . . . . . In the Assamboo hills and their continuation, the Andaman hills, the Western Ghâts, as far north, at any rate, as Khandala, whence I have specimens, the Pulneys, Anamallis, and Nilghiris, the bird is common, and in the cold season it may even be found, at some little distance from the bases of these, in convenient jungles, and on the Malabar coast to the shores of the sea; but it is in no sense a plains bird, and never occurs in India in the open country at any distance from one of these hill series." Now it is singular that though it cannot be called a denizen of open country in Ceylon, it should be so plentiful an inhabitant of low-country forest in many parts of the island. The solution of this problem, no doubt, lies in the fact that the flat or low districts of South India are not covered with forest as in Ceylon. Jerdon remarks that it is found in all the lofty jungles from near the level of the sea to 5000 feet on the Nilghiri slopes, and says that it is, perhaps, most abundant at moderate elevations.

Habits.—The Orange Minivet affects lofty trees in the up-country forests and in patna-woods, keeping much to the topmost branches, or flying gaily about from limb to limb; in the low country it is partial to fine jungle bordering rivers or surrounding remote or secluded tanks. The male is a very showy bird, enlivening the gloom of the primeval forest as it flies from tree to tree or displays its bright red plumage among the green boughs far overhead. When not breeding, it associates in little flocks, either of several females alone, or one or two males accompanied by a little party of the other sex; and from this habit it has acquired its name of "Sultan" in the coffee-districts. It is constantly uttering a weak, though cheerful, little warble, or

otherwise it would be generally overlooked by the collector while threading his way in the underwood beneath it. Its diet consists of small butterflies and various winged insects, some of which it will occasionally take on the wing as they pass through the branches. In the woods of the Horton Plains I saw it catching insects in the moss with which the trees are entirely covered in that cool region, and its brilliant plumage furnished a striking contrast to the cold grey-looking aspect of the jungle.

Jerdon notices that in India "it keeps generally to the tops of high trees, usually in flocks of four or five; the sexes often apart from one another, all frisking about, picking insects off a branch or leaf, or occasionally catching one in the air."

Nidification.—I have never been able to obtain any information concerning the nesting of this species in Ceylon; but Mr. Hume describes the nest, in his 'Rough Draft of Nests and Eggs of Indian Birds,' from information received from Miss Cockburn. He says, "The nests are comparatively massive little cups placed on or sometimes in the fork of slender boughs. They are usually composed of excessively fine twigs, the size of fir-needles, and they are densely plastered over the whole exterior surface with greenish-grey lichens, so closely put together that the side of the nest looks exactly like a piece of lichen-covered branch; there appears to be no lining, and the eggs are laid on the fine little twigs which compose the body of the nest." The season for laying is confined to July, which is probably the same in the damp districts of Ceylon. The egg is described as pale greenish, "pretty thickly streaked and spotted, mostly so at the large end, with pale yellowish brown and pale rather dingy purple."

PERICROCOTUS PEREGRINUS.

(THE LITTLE MINIVET.)

Parus peregrinus, Linn. Syst. Nat. i. p. 342 (1766).

Muscicapa flammea, Forster, Ind. Zool. pl. 15. fig. 2 (1781).

Phœnicornis peregrina, Gould, Cent. Him. B. pl. 9 (1832); Jerd. Cat. B. S. India, Madr. Journ. 1839, x. p. 244.

Pericrocotus peregrinus, Gray, Gen. Birds, i. p. 282 (1845); Blyth, Cat. B. Mus. A. S. B. p. 193 (1849); Kelaart, Prodromus, Cat. p. 123 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 127; Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 140 (1854); Gould, B. of Asia, pt. ix. (1857); Jerdon, B. of Ind. i. p. 423 (1862); Holdsworth, P. Z. S. 1872, p. 438; Hume, Nests & Eggs (Rough Draft), p. 184 (1873); id. Str. Feath. 1873, p. 184; id. ibid. 1874, p. 209; Legge, Ibis, 1875, p. 284; Sharpe, Str. Feath. 1876, p. 209; Armstrong, *t. c.* p. 318; Hume, ibid. 1877, p. 179; Tweeddale, Ibis, 1877, p. 315; Hume and Davison, Str. Feath. 1878 (Birds of Tenass.), p. 212; Sharpe, Cat. B. iv. p. 76 (1879).

The Crimson-rumped Flycatcher, *The Malabar Titmouse*, Latham; *Small Red Flycatcher*, Sportsmen in Ceylon.

Bulal-chasm. Hind.; also *Sath-sayili* and *Chota sath saki kapi*, Bengal.; *Kunkum-pu-jitta*, Telugu (Jerdon); *Batu gene kurula* or *Kos-kurula*, Sinhalese.

Adult male and female. Length 5·8 to 6·0 inches; wing 2·6 to 2·75; tail 2·6 to 2·7; tarsus 0·65; mid toe and claw 0·55; bill to gape 0·58 to 0·6.

Male. Iris sepia-brown; bill black; legs and feet black.

Forehead and head above, hind neck, and back dark ashy; lores, face, ear-coverts, chin and throat, wings, and three central pairs of tail-feathers, with the bases of the remainder, black; upper tail-coverts, a band across the secondaries, and all the primaries but the first four (in all specimens I have seen), breast, and flanks flame-red or scarlet, palest on the wings; two outer rectrices on each side and a terminal spot on the next pair orange-red; abdomen yellowish red, blending into the scarlet of the breast; under tail- and under wing-coverts yellowish red; thighs blackish.

Female. Iris and bill as in the male; legs and feet brownish black.

The upper parts, which in the male are ashy, are in the female brownish cinereous; wings and tail brownish black, with the same markings as in the male but of a more yellowish colour; upper tail-coverts scarlet, gradually blending with a greenish hue into the brownish grey of the back; above the lores, which are concolorous with the crown, a whitish stripe extending to the anterior upper edge of the eye; beneath whitish grey, washed with orange-yellowish, which becomes the ground-colour on the lower parts; under tail-coverts pale orange-red, concolorous with the outer tail-feathers; under wing-coverts yellowish red.

Obs. In India this species varies to an extraordinary extent in the tone of the orange coloration, which is particularly noticeable in the wing-markings. Mr. Hume, in an exhaustive article on the species ('Stray Feathers,' 1877, p. 179), gives the result of his elaborate researches into the question, from which it may be gathered that males vary in their colours from the blackish iron-grey mantle and orange-scarlet of the breast, abdomen, under tail-coverts, rump, and wing-spot observable in specimens from the extreme south of India, to the pale grey mantle, greyish dusky throat, whitish lower parts (tinged with fiery saffron on the breast), and mingled pale yellow and pale scarlet rump and wing-spot existing in specimens from Sindh. Elsewhere, in the same journal for 1873, he remarks that the deepest-coloured specimens are from peninsular India, then those from Lower Bengal and the eastern portions of the Central Provinces are somewhat paler, those from the rest of the Central Provinces,

the North-west Provinces, and the Punjab paler still, and finally those from Sindh much the palest of all. As regards size, examples from different parts of India, Burmah, and the Andamans are shown to vary in the wing, both in males and females, from 2·6 to 2·9 inches. I observe that three specimens in the British Museum from Kamptee measure 2·6 in the wing, and they have the upper surface precisely as in Ceylonese birds, the breast perhaps a trifle less brilliant, and the wing-bar extending out to the 6th primary. A fourth, from Madras, has the wing 2·8, and the wing-bar reaching to the 5th primary. In Ceylon specimens I have always found this band limited to the 5th quill, the first four being without any orange marking. Mr. Hume notices that from Anjango, Sindh, Dehra, Tenasserim, and Elephant Point males sometimes have the wing-bar extending upon the 5th quill, and from Akyab, Amherst, Port Blair, Moulmein, and Alteran river females exhibit the same character.

Distribution.—The Little Minivet is generally diffused throughout Ceylon, but it is more numerous in the northern half, from Colombo to Jaffna, than to the south of the former place. It may often be seen in the cinnamon-gardens and in the adjacent cultivated, though woody, country. It is plentiful in the Jaffna peninsula, where it replaces the last species, and is also numerous throughout the dry forest-regions between there and Dambulla, as also in the Seven Korales and corresponding low country on the other side of the island. To the south of the Haputale ranges it is likewise to be found in the forests. In the damper portions of the south-west of the island it is not so frequent. I have observed it in most of the coffee-districts; and Mr. Holdsworth records it as a winter visitor to Nuwara Elliya, but it is neither so common there nor in the hills of the south as the foregoing species.

On the continent this bird enjoys a more extended range than any of its congeners. Mr. Hume writes:—"I have the species from almost every part of India, Burmah (including Pegu, Arrakan, Tenasserim), and the Andamans; but it is not known to occur in the Nicobars, and is not found, to the best of my knowledge, in the north-west Punjab (Trans-jhilum, in fact), and it neither ascends the Nilghiris nor the Himalayas." In the latter assertion, as regards the south of India, the experience of Messrs. Bourdillon and Fairbank bear him out; for the former does not record it from the Travancore hills, and the latter did not find it above 5000 feet in the Palanis. Mr. Armstrong says it is abundant in Rangoon, and Mr. Davison found it to be a permanent resident in the Andamans. From the latter island its range extends still further to the south, as Lord Tweeddale records a specimen in Mr. Buxton's collection from Lampong, S.E. Sumatra. Mr. Wallace also procured it in Java.

Habits.—This pretty little bird frequents a variety of open situations, but does not like the interior of heavy forests. It is found in the compounds about native villages, among isolated groves, in bushy jungle dotted with large trees, in woods surrounding paddy-fields, and in forest near the edges of tanks and rivers. It usually frequents large trees and keeps mostly to the upper branches. It associates in small parties, which often consist of several females in company with one male, the whole uttering a weak sibilant note resembling the syllables *tsetze, tsetze,* and moving on in the pursuit of insects from one tree to another. It may sometimes be seen in company with the preceding species, and often launches out into the air to capture a passing insect. Mr. Holdsworth noticed that at Nuwara Elliya it frequented bushes; but in low country it is usually seen seeking for its food in the top branches of umbrageous trees. Jerdon remarks that it is a "restless and active little creature, ever engaged in diligently examining the extreme branches of trees, gleaning among the foliage, and hanging from the slender twigs like a Titmouse. It feeds upon various larvæ (which are its favourite food) and small insects."

Nidification.—I have reason to believe that this bird breeds in the Western Province in May and June, but I was never fortunate enough to obtain its nest. In India it nests during the months of June, July, and August. Mr. Hume writes that the nest is small and neat, and done up generally, like a Chaffinch's, to resemble the bark of the tree on which it is placed. It is sometimes "composed of very fine needle-like twigs carefully bound together externally with cobwebs and coated with small pieces of bark or dead leaves. . . . . There appears to be rarely any regular lining; a very little down or cobwebs form the only bed for the eggs, and even this is often wanting." Mr. F. Blewitt writes that in Jhansie and Saugor the tamarind is the favourite tree: nests built in them were composed of "fine petioles of leaves with a thick coating all over

of what looked like spiders' webs ;" attached to this were the dry leaves of the tamarind-tree. The nests were fixed in between two delicate forks at the extreme end of a branch near the top of the tree. The eggs, which are usually three in number, are pale delicate greenish white, and they are richly marked with bright, slightly brownish-red specks or blots, "which, always more numerous at the large end, have a tendency there to form a mottled irregular cap." They average in size 0·67 inch in length by 0·53 in breadth.

Genus LALAGE.

Bill more slender and narrower at the base than in *Pericrocotus*; the culmen gently curved from the base and not suddenly bent at the tip. Nasal bristles short and stiff; rictal bristles scanty. Wings longer than the tail, pointed, and with the 3rd and 4th quills subequal and longest; the 1st longer than in the last genus. Tail moderately long, rounded at the tip. Tarsus about equal to the middle toe and its claw, and shielded with broad scutæ. Toes slender; the middle toe equal to the inner with its claw.

LALAGE SYKESI.

(THE BLACK-HEADED CUCKOO-SHRIKE.)

Ceblepyris canus, Sykes, P. Z. S. 1832, p. 87.

Lalage sykesi, Strickl. Ann. & Mag. Nat. Hist. 1844, xiii. p. 36; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 175; Sharpe, Cat. B. iv. p. 89 (1879).

Campephaga sykesii, Gray, Gen. B. i. p. 283; Blyth, Cat. B. Mus. A. S. B. p. 191 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 128; Blyth, Ibis, 1866, p. 368.

Volvocivora sykesii, Bp. Consp. i. p. 356; Jerd. B. of Ind. i. p. 414 (1862); Hume, Nests and Eggs, i. p. 179 (1873); Ball, Str. Feath. 1874, p. 399, et 1875, p. 291; Butler, ibid. 1875, p. 464; Fairbank, ibid. 1876, p. 256, et 1877, p. 400; Butler, ibid. 1877, p. 220.

Lesser Caterpillar-catcher of some.

Jungli kasya, Hind.; *Chuma akurayi*, lit. "Lesser File-bird," Telugu.

Adult male. Length 7·3 to 7·75 inches; wing 3·8 to 4·0; tail 3·0; tarsus 0·8; middle toe and claw 0·75 to 0·8; bill to gape 0·85.

Iris brownish red; bill black; legs and feet black, with slaty edges to the scales of the tarsi; claws black.

Head, back, and sides of neck, chin, throat, and fore neck glossy black, abruptly divided from the pale grey of the chest and flanks, and blending into the slate-grey of the back, scapulars, wing-coverts, and upper tail-coverts, on which latter this colour is palest; wings and tail black, the 1st primary wholly so, the remainder with the basal portion of their inner webs white; secondaries and greater coverts margined with the grey of the back; the three outer pairs of tail-feathers white at the tips; the next pair have their extreme tips slaty white, the two central ones slaty, darkening into blackish near the tips; lower parts white, blending into the grey of the flanks and chest; under wing-coverts whitish, washed with slaty; thighs slaty.

Adult female. Shorter in the wing, which usually measures 3·7 inches.

Iris brown; bill blackish, light at the gape and base of lower mandible; legs and feet brownish slate.

Above dusky bluish grey, wanting the black head; a light line above the brownish lores; ear-coverts striped with white; rump barred with white; wings brownish black, with the edgings whitish: the central rectrices without the black patch. Beneath white, barred, except on the belly and lower tail-coverts, with blackish brown; thighs slaty, barred with dark grey.

Young. Bill not so black as in the adult female. Upper surface brownish slate, the feathers with a blackish subterminal bar and white tip. Tertials very broadly edged with white, and the quills and tail-feathers all tipped white. Beneath barred as the female.

Male in second stage very similar to the adult female. The lores and ear-coverts black, and the head generally mingled with black feathers; a bluish wash over the throat and chest; the bars on the flanks and lower breast not so bold as in the adult female. The loral spot is blacker than adults of the other sex. An example in this stage before me has also the ground-colour of the throat pervaded with greyish, but nevertheless barred quite up to the chin; there are a few black feathers on the crown, some of which are new, while others are old and appear to be changing from the grey to the black colour.

Obs. Blyth has stated that the adult female has a black head and neck, as in the male. Mr. Holdsworth's experience of the plumage of this sex accords with my own; and I cannot come to any other conclusion but that Blyth's specimens from which he drew this inference were wrongly sexed. Mr. Adam, I observe, speaks of an immature female, shot at Sambhur, having some of the head-feathers black, and the under surface, from the throat to the abdomen, crossed with wavy lines; this is the precise character of the change of plumage in the young male.

Ceylonese specimens of this bird compare well with Indian. The latter are, perhaps, a trifle larger. Two examples

(males) in the British Museum, from Mysore, have the wings 3·9 and 4·0, and the tails 3·0 and 3·3; both these are *slightly* more nigrescent on the interscapular region than Ceylonese birds, and the slate-colour of the breast descends further down the under surface. A young male from Vingorla has the wing 4·1, and is somewhat more cinereous on the back than immature Ceylonese examples.

Distribution.—This small Cuckoo-Shrike is found in most lowland districts in the island, and ascends into the Kandyan Province to a general altitude of 3000 feet, although in Uva and Madulsima I have seen it much higher than this. It probably finds its way to the Nuwara-Elliya district from the Uva patnas in the dry season, for I find there are some examples from the Sanatarium in the British Museum. They were collected by Mr. Boate, and, I imagine, must have been stragglers thither during the N.E. monsoon. Neither Mr. Holdsworth nor Mr. Bligh have seen it at Nuwara Elliya; but I observe that Layard says it is found "over the whole island." This expression, however, may refer to the low country. As regards the latter region, I may remark that it is a common bird in the maritime districts of the south-east and north, and in the Western district between Puttalam and Galle it is likewise frequent. According to my experience its numbers decrease towards the hills, except perhaps in the Eastern Province, throughout which I found it plentiful; for it evidently prefers the low open jungles of the sea-board to the thick forests of the interior. In the Western Province it is, however, more plentiful in Saffragam and in the Raygam and Pasdun Korales than near Colombo.

On the mainland it is found, according to Jerdon, throughout the whole of India; but is neither common nor abundant. It is most plentiful in wooded countries where there are considerable tracts of low jungle, not being found in the forests of Southern India, although it is met with in avenues in that part of the country. I do not find it recorded from the Travancore hills; but Mr. Fairbank obtained one example at Perinr in the Palanis; he also found it rare at Ahmednagar, though common in certain localities in the Belganm district. Proceeding north we find Mr. Ball recording it as a rare bird in Chota Nagpur, Mr. Levin having shot a single example at Palamow; further to the north-east it is found, according to Jerdon, at Calcutta; on the western side of the peninsula it does not appear to be common. Captain Butler obtained a few specimens at Mount Aboo, but none elsewhere; and Mr. Adam records it from the Sambhur-Lake district, though only as a straggler.

Habits.—This species frequents tall trees in open forest or in native compounds, low bushes on the borders of waste land on the sea-coast, isolated clumps in partially cleared forest, and low scrub jungle. Out of the breeding-season the males wander about alone, and the females and young birds become gregarious, associating in flocks of 5, 10, or 20, and may be seen at evening time flying from bush to bush on the flats round the salt lagoons in the north. In the south it affects Jack-trees in preference to others, climbing about the small branches and among the leaves, preying on the caterpillars and various insects which abound in them. The note of the male is a melodious whistle, and the females have a monosyllabic chirp. Layard merely remarks of it that it is "found in pairs, frequenting high trees and avoiding the neighbourhood of habitations; it feeds on insects." This observation as to its consorting in pairs is only true of it as regards the breeding-season. Jerdon writes more correctly of it that "it hunts usually in small parties, occasionally singly or in pairs, flying from tree to tree, and slowly and carefully examining the foliage, prying searchingly all round and under the leaves to discover a suitable morsel. It continues its search, hopping and flying from branch to branch, till the tree has been well inspected, when the flock flies off together to another tree. Its favourite food is caterpillars and other soft insects. It is usually a silent bird, but has a harsh call; and on one occasion in June I heard the male giving out a clear whistling call as he was flying from tree to tree."

Nidification.—With us this Cuckoo-Shrike breeds in April in the Western Province. Mr. MacVicar writes me of the discovery, by himself, of two nests last year near Colombo. One was built in the topmost branch of a young Jack-tree, about 40 feet high. It was very small and shallow, measuring 2·8 inches in breadth and only 0·8 inch in depth, and the old bird could be seen plainly from beneath sitting across it. The other was situated on the top of a tree about 20 feet from the ground, and was built in the same manner. The materials are not mentioned; but I conclude they consisted of thin twigs and roots with most likely a coating of

spiders' webs on the exterior, as has been found to be the case in India. The eggs measured 0·87 inch by 0·62 and 0·85 by 0·62 respectively.

Mr. Blewitt found the nest in India in July, and describes its construction as above, with the remark that its formation was exactly that of the Large Cuckoo-Shrike, *Graucalus macii*. The eggs were two in number, deep green, mottled densely with brown towards the large end, and blotched and streaked throughout with pale blue; they measured 0·85 by 0·65 inch.

PASSERES.

Fam. PRIONOPIDÆ.

Bill Shrike-like, with a distinct notch in the tip of the upper mandible. Tail moderate, rounded or even. Legs and feet small.

Feathers of the rump not stiff, as in the last family.

Subfam. PRIONOPINÆ.

Bill broader than it is high. (*Sharpe*, Cat. B. iii. p. 270.)

Genus TEPHRODORNIS.

Bill stout, wider at the base than high; culmen keeled and curved rather suddenly near the tip. Nostrils covered by bristly plumes; rictal bristles long. Wings with the 4th quill the longest, the 2nd equal to the secondaries, and the 1st about half the length of the 2nd. Tarsus longer than the middle toe, and feathered slightly below the knee. Outer toe slightly syndactyle and longer than the inner; claws well curved.

TEPHRODORNIS PONDICERIANUS.

(THE COMMON WOOD-SHRIKE.)

Muscicapa pondiceriana, Gm. Syst. Nat. i. p. 939 (1788).

Tephrodornis superciliosus, Jerdon, Cat. B. S. India, Madr. Journ. 1839, x. p. 237.

Tephrodornis pondiceriana, Blyth, J. A. S. B. 1840, xv. p. 305; id. Cat. B. Mus. A. S. B. p. 153 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 169 (1854); Jerdon, B. of Ind. i. p. 410 (1862); Holdsworth, P. Z. S. 1872, p. 437; Hume, Nests and Eggs, i. p. 176 (1873); id. Str. Feath. 1873, p. 177; Adam, *t. c.* p. 376; Ball, Str. Feath. 1874, p. 399; Hume, ibid. 1875, p. 92; Legge, ibid. 1876, p. 243; Hume, *t. c.* p. 458.

Tephrodornis affinis, Blyth, J.A. S. B. 1847. xvi. p. 473; id. Cat. B. Mus. A. S. B. p. 153 (1849); Kelaart, Prodromus, Cat. p. 124 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 131; Blyth, Ibis, 1867, p. 305; Hume, Str. Feath. 1873, p. 437; Legge, Ibis, 1874, p. 16.

Tephrodornis pondicerianus, Sharpe, Cat. B. iii. p. 275.

Gobe-mouche de Pondichéry, Sonnerat; *The Keroula Shrike*, Latham; *Butcher-bird*, Kelaart; *The Bush-Shrike* in India.

Keroula, Hind.; *Chudukka*, Beng.; *Ula pitta*, lit. "Whistling-bird," Tel.

Adult male and female. Length 5·9 to 6·4 inches; wing 3·2 to 3·5; tail 2·4 to 2·5; tarsus 0·7 to 0·8; mid toe and claw 0·65; bill to gape 0·95 to 1·05.

Iris pale olive or yellowish olive, sometimes with the inner half bright yellow, at others with a green inner ring; bill with the upper mandible and terminal half of the lower dark brown, base beneath light fleshy; legs and feet dusky slate-blue or bluish slate, claws blackish.

Above slaty grey in specimens from the hills and Western Province, duskier or ashy brown in those from the northern parts of the island; lores, upper part of cheek, and the ear-coverts blackish brown; a whitish supercilium, variable in size and in length, but always more or less well defined; beneath the brown cheek-patch a whitish stripe; wings brown, the tertials pale-edged; tips of the longer rump-feathers and the shorter upper tail-coverts white, forming a bar across the rump, which is variable in width and usually broadest in birds which are most slaty in hue; longer upper tail-coverts black, four central pairs of rectrices blackish brown, darkening to black at the base; two outer pairs white with dark bases, and the tips marked as follows:—a brown stripe near the tip of the external web of the outermost, the same at the tip of the next, with an adjacent spot often across the inner web; in some specimens, probably not very old, this latter does not exist, the streaks on the outer webs are very small, and the outer web of the 3rd feather has a white streak at the centre.

Throat, lower breast, belly, and under tail-coverts white; the sides of the throat more or less washed with brownish, in the form of streaks, and the chest and upper part of the breast pale cinereous ashy; thighs brownish.

Obs. As already remarked, the tints in the plumage of this species vary. I have found that the most slaty-coloured specimens come from the Western Province and the Nuwara-Elliya district; a Haputale and a Dumbara specimen are both brownish, nearly as much so as a Trincomalie and an Aripu example. Birds from the Galle district do not seem to be as slaty as those from Colombo. It must be also observed that when newly acquired, the feathers are most bluish; on becoming abraded, they lose the slaty tint and present an ashy appearance.

Young. Bill lighter than the adult, as a rule; iris olive.

In nestling plumage pale rufous-brown above, the forehead and head very conspicuously spotted with white, the back less so; greater wing-coverts and tertials fulvous, with a dark crescentic line and white tips; the *three* outer rectrices are white and more marked at the tips; the dark stripe from the base of the lower mandible is more defined and the supercilium absent, although the white spots sometimes take the form of a stripe.

In the next stage the upper surface is darker and less spotted; there is a trace of a supercilium beyond the eye; in some the upper tail-coverts are partially white; the third rectrix from the exterior is now blackish brown, as in the adult, and all are tipped with white. Under surface much as in the adult; the chest, perhaps, a little darker.

Obs. Concerning few species of Indian birds have opinions differed so much as with reference to the present. The Ceylonese race was separated by Blyth (*loc. cit.*) on account of "its being greyer, and wanting the conspicuous white supercilium." Layard followed Blyth; and then Mr. Holdsworth, in his admirable 'Catalogue of Ceylon Birds,' after the examination of a large series of Indian and insular examples, reunited it with the Indian form. Mr. Hume, in a review of some of the Ceylonese species mentioned in Mr. Holdsworth's paper, expressed his doubts as to the possibility of keeping the Ceylon race distinct, on account of the extremely variable character of the bird throughout its entire range from Burmah across to Sindh, and thence to the south of India and Ceylon. Finally, Mr. Sharpe, in his 'Catalogue of Birds,' vol. iii., adheres to Blyth's determination, and remarks that he considers it not only distinct, but more nearly allied to the Malaccan *T. gularis* than to the Indian bird. I entered upon the battle-field, I must say, somewhat biassed in favour of Mr. Sharpe's weighty verdict; but after a most careful examination of all the Ceylonese and Indian examples I could lay my hands on, I find that it is a species which is most unreliable in all those characteristics which are alleged as sufficient to divide it into the two races in question; and I consider that if the Ceylonese bird is separated from the South-Indian on account of its more slaty tints, so must the N.W.-Himalayan bird be held to be distinct from the Nepal and Pegu race on account of the cinereous hue of the former, as distinguished from the sandy colour of the latter. The colour of the upper surface varies throughout the whole range of the bird; and though the supercilia in the Indian birds are longer and generally broader, and the white rump-band less in extent than in the insular form, yet these characters are not always alike in either one race or the other. The distribution of the facial markings is absolutely the same in the Indian and the Ceylon birds, and the coloration of the outer tail-feathers precisely alike in both. Climate has no doubt much to do with the brownish and the slaty tints in this bird throughout its Indian range: it has in Ceylon; for the northern birds are, as a rule, the brownest, and those from the damp parts the bluest. Mr. Hume shows the same to be the case in the south of India, as he finds the birds from the hot arid island of Ramisserum earthy brown, and those from the wet district of Anjango as ashy almost as those from Ceylon. With regard to size the Indian birds are slightly larger; but this is the rule with most species found in both localities. The following are some of the wing-measurements I have taken from a large series examined:—Pegu, w. 3·4 inches; N.W. Himalayas, w. 3·55; Behar, w. 3·45; N.W. Himalayas, w. 3·5; ditto, w. 3·5; Kamptee, w. 3·55. Birds from Pegu and N.E. Bengal appear to have the largest supercilia.

Distribution.—The Bush-Shrike is found throughout all the low country and the hill-regions to about 5000 feet. Large tracts of country may, however, be traversed without seeing it, showing that it confines itself to particular localities. It is generally distributed over the northern and eastern portions of the island, and is resident there during both monsoons. It is likewise numerous in the south-west, and slightly less so on the west coast; but in the latter part it retires from exposed places on the sea-board to some distance inland during the wet weather of the south-west monsoon. I have, however, found it between Kotte and Colombo in June and July, so that its migration is only partial. Mr. Holdsworth, I believe, observed that it left the Aripu district in May; and this movement would be occasioned by the force of the S.W. monsoon. I did not observe the same inland march in the south-western part of the island, probably on account of the sheltered nature of the country, which is hilly close to the sea-coast. Layard, who speaks of it as being common about Jaffna, Colombo, and Kandy, thought it to be migratory. It appears to be a straggler to the upper hills, as there is a specimen in the national collection from "near Nuwara Elliya," collected by Mr. Boate. I have never heard of any one else having obtained it there; and it is possible that the locality may be wrong in this instance, as near Nuwara Elliya might well mean Wilson's bungalow or other locality down the pass towards the Uva side, where it is no doubt met with. Mr. Bligh has obtained it in Haputale at about 5000 feet elevation.

On the continent it is found in the north of India from Tenasserim and Burmah, through Bengal and the sub-Himalayan districts to the N.W. Himalayas and Sindh, and thence through the peninsula to the extreme south and Adam's Bridge. At Thayetmyo Mr. Oates says it is often seen, and it was obtained as far south as Tonghoo by Lieut. Ramsay. There are specimens from Nepal, N.W. Himalayas, and Behar in the national collection. About the Sambhur Lake Mr. Adam did not find it common; but in Sindh it is the reverse in cultivated regions, though never seen in barren districts. At Mount Aboo Captain Butler remarks that it is somewhat common, though less often seen in the plains. In Chota Nagpur it is resident, says Mr. Ball; and at Maunbhum Captain Beavan noticed that it bred chiefly. Mr. Fairbank procured it at Ahmednagar, and remarks that it is more common along the Sahyadri hills; he likewise met with it in the Palanis. It is not

recorded from the Travancore hills, where Mr. Bourdillon procured the allied species *T. sylvicola*; and I observe that he says it is more abundant in the Carnatic than "either on the Malabar coast or on the bare tableland."

Habits.—This little Shrike frequents isolated trees standing in low scrub or in young cocoanut- or cinnamon-plantations, the edges of forest, small groves in open land, and compounds surrounding villages and native houses. It usually associates in small troops of four or five, which wander from tree to tree, flying one after the other when they move until the flock are again reunited. They are not very active in their movements, hopping slowly about among the leafy boughs of trees, and peering under the leaves in search of their food, all the while uttering a melancholy little whistle of several notes, which has the peculiarity of being very easily carried on the wind, and being, consequently, heard at a considerable distance. Moths and small butterflies form a considerable portion of its food. Jerdon says that the Telugus give it the name of "Whistling-bird" on account of its mellow notes; and Mr. Oates writes that it occasionally "seats itself upon the top of a bough and sings a well-conducted and rather pretty song."

Nidification.—I have no information concerning the nesting of this Wood-Shrike in Ceylon; but its nest appears to be well known in India; and in 'Stray Feathers' we gather that it breeds from the latter part of March until August, although April is the usual month for rearing its young. I have procured the immature bird in spotted plumage in April, and judge from the appearance of its feathers that it had arrived nearly at the end of its first year, which would make the nesting-season in the west of Ceylon about the middle of the S.W. monsoon. Mr. Hume describes the nest as "a broad shallow cup, somewhat oval interiorly, with the materials very compactly and closely put together. The basal portion and framework of the sides consisted of very fine stems of some herbaceous plant about the thickness of an ordinary pin; it was lined with a little wool and a quantity of silky fibre; exteriorly it was bound round with a good deal of the same fibre and pretty thickly felted with cobwebs. The egg-cavity measured 2·5 inches in diameter one way and only 2·0 the other way, while in depth it was barely 0·86." This nest contained three eggs; but the number varies, as Captain G. Marshall found four and Captain Beavan two in a nest. They are described as very Shrike-like in appearance, of "a pale greenish-white or creamy stone ground-colour, more or less thickly spotted and blotched with different shades of yellowish and reddish brown, many of the markings being almost invariably gathered into a conspicuous, but irregular and ill-defined zone near the large end, which is intermingled with pale and dingy purple clouds. The average of a dozen eggs is 0·75 by 0·61 inch" (*Hume*).

Genus HEMIPUS.

Bill wide at the base, triangular; the culmen keeled, straight at the base, and suddenly curved at the tip, which is distinctly notched. Nostrils protected by a tuft of bristles. Wings long, with the 4th and 5th quills the longest, and the 2nd shorter than the secondaries. Tail rather long, the lateral feathers falling short of the middle pair by about the length of the hind toe and its claw. Legs and feet weak; the tarsus longer than the middle toe and its claw.

HEMIPUS PICATUS.

(THE LITTLE PIED SHRIKE.)

Muscicapa picata, Sykes, P. Z. S. 1832, p. 85; Blyth, J. A. S. B. 1842, xi. p. 458; Gray, Gen. Birds, i. p. 263 (1845).

Hemipus picatus, Blyth, J. A. S. B. 1846, xv. p. 305; id. Cat. B. Mus. A. S. B. p. 154 (1849); Kelaart, Prodromus, Cat. p. 123 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 126; Jerdon, B. of Ind. i. p. 413 (1862); Holdsworth, P. Z. S. 1872, p. 437; Hume, Nests and Eggs (Rough Draft), p. 178 (1873); id. Str. Feath. 1873, p. 435; Ball, ibid. 1874, p. 399; Legge, Ibis, 1874, p. 16; Hume, Str. F. 1875, p. 93; Bourdillon, ibid. 1876, p. 393; Sharpe, Cat. B. iii. p. 307 (1877); Hume, Str. Feath. 1878 (B. of Tenasserim), p. 207.

The Black-and-white Flycatcher, *The Shrike-like Flycatcher* of Indian authors; *The Black-and-white Hemipus*, Kelaart.

Adult male and female. Length 5·2 to 5·4 inches; wing 2·2 to 2·4; tail 2·2 to 2·3; tarsus 0·6; mid toe and claw 0·55; bill to gape 0·65 to 0·75.

Iris reddish brown, with a light mottled outer circle; bill black; legs and feet blackish, claws paler.

Head, hind neck, back, wings, upper tail-coverts, and tail deep black, glossed with green on the head and back; an incomplete nuchal collar, a broad band across the rump, a bar on the wing formed by the tips of the greater coverts, the edges of the longer tertials and of several of the secondaries, and the terminal portion of the 4 outer rectrices white; the white marking extends up most of the outer web of the lateral tail-feather and is confined to a small spot at the tip of the 4th; chin, lower part of cheeks, sides of neck, belly, under tail- and under wing-coverts whitish, passing into the reddish ashy of the lower throat, breast, and flanks.

Obs. The northern form of this little Shrike (*H. capitalis* of M'Clelland) is united with the present bird by Mr. Hume, but kept distinct by Mr. Sharpe, on account of its brownish back. The former contends (Str. Feath. 1873, p. 475) that the brown birds are females. I have not observed this feature in Ceylon examples, the females being just as black as the males; and Ceylonese birds are identical with examples which I have examined from South India and Mahabaleshwar, as regards size, colour of upper and under surface, and distribution of white marking. A male from Darjiling, in the British Museum, is similar to the Mahabaleshwar bird, but has the tail more deeply tipped with white; but several others from the former locality, which may, perhaps, be males, have the upper surface, wings, and wing-coverts brown. The latest testimony, however, with regard to the northern race, and which is contained in Mr. Hume's admirable paper on the birds of Tenasserim, shows that Assam, Sikkim, and Kumaon specimens of both sexes have brown backs, and that out of ten males from Darjiling, one only has the back black. Others, again, from various localities along the Himalayas have the back black; and this, I think, goes to prove that there *are* two different races—the southern with black head and back, and the northern with black head and brown back, both of which may occur, as Mr. Hume suggests, in the Himalayan districts. The latter seems to be the larger, measuring in total length from 5·35 to 5·45, and in the wing from 2·3 to 2·4. The Mahabaleshwar example above noticed measures—wing 2·3 inches, tail 2·3, tarsus 0·45, bill to gape 0·7.

Hemipus obscurus, Horsf., from Java, is not distantly related to our bird; it has the back and wings green-black, no bar or white marking on the wing; the upper tail-coverts white, without the transverse bar of black in the centre of the white patch; tail black, the lateral feathers with an outer and an inner white edge; beneath white; chest washed with grey.

Distribution.—This little Shrike is dispersed throughout the forests and heavy jungles of the island, but is generally more numerous in the Kandyan Province, even at high altitudes, and in the southern coffee-districts than in the low country. Although scarce at Horton Plains, it is a common bird about Nuwara Elliya, Kandapolla, and in the main range, and is likewise met with in all the intermediate coffee-districts. In the timber-forests and also in the cultivated country near the sea-board of the south-west it is tolerably plentiful; and the same may be said of the jungles in the eastern portion of the island, and of the forest-

tract of the northern plains, stretching from Puttalam across to the Mahawelliganga, in a part of which (the high jungles between Minery and Kowdella) I found it as plentiful as in the hills. In the Saffragam forests and the wilder districts of the Western Province nearer the sea it is likewise found; and I have procured it as near Colombo as the jungle at Atturugeria, on the Kotte and Bopé road.

This little Shrike is common in the south of India and the central portions of the peninsula. Jerdon found it in the Nilghiris and along the crest of the Western Ghâts. On the Nilghiris he obtained it as high as 7000 feet. Mr. Bourdillon remarks of it that it is not very abundant in Travancore; and Mr. Fairbank observed but few on the Palanis. Should Mr. Hume be correct in joining the two species, *H. capitalis* and *H. picatus*, the range of this little bird becomes considerably extended, as the northern form is found in Chota Nagpur, Northern India, the Himalayas up to an elevation of 5000 feet, and also in Burmah. In Tenasserim Mr. Davison procured it in the neighbourhood of Pahpoon only; and I conclude this is the most southerly point to which it has been traced on the eastern side of the Bay.

Habits.—This is a tame but at the same time an interesting little bird; so unobservant is it of human intrusion on its haunts that it may be watched most closely without its being disturbed; and I know no diminutive denizen of the tall forests of the Ceylon mountains, save perhaps the lively little Grey-headed Flycatcher (*Culicicapa ceylonensis*), which better repays a cursory glance at its manners and occupations. It is generally found in pairs, frequenting tall trees near the edges of forest and heavy jungle; and it perches high aloft among the branches, sallying out from its seat after the manner of a Flycatcher, and catching a passing insect, which it will frequently convey to its original perch before devouring. It is slower in its movements than the members of the family Muscicapidæ, but on the whole its habits are more those of a Flycatcher than a Shrike. It is of stationary habit, frequenting the same spot for hours together; and it usually prefers the company of its own fellows to that of other small birds, though it may at times be seen with Minivets, Bluetits, and Grey-headed Flycathers. It constantly utters its shrill little note, which may be likened to the syllables *tchēetiti, tchēetiti, tchēetiti-chēēe*. Jerdon remarks that in India "it is generally seen in small parties of five or six wandering about from tree to tree, and every now and then darting on insects in the air. It has a pleasing little song, not often heard however." My experience of it in Ceylon differs from this, for there it constantly utters the above-described note. Mr. Oates, in writing of the Tenasserim bird, likewise comments on its Flycatcher-like habits as follows:—"They are rather Flycatchers than Shrikes in their habits, moving about, no doubt, amongst the leaves at the tops of trees like the Wood-Shrike, but continually darting out and seizing insects on the wing, which the Wood-Shrikes, I think, never do. They continually call to each other, uttering a sharp soft note."

Nidification.—In the south of India this little Shrike breeds in March. Mr. Davison thus describes a nest he found:—"For the size of the bird it was an exceedingly small, shallow nest, and might very easily have passed unnoticed; the bird sitting on it appeared to be resting only on a small lump of moss and lichen." It was placed in the fork of an upper branch of a rather tall *Berberis leschenaulti*, and was composed of grass and fine roots, covered externally with pieces of cobweb, grey lichen, and bits of moss, taken evidently from the same tree on which the nest was built. The eggs were three in number, elongated ovals, and entirely devoid of gloss; the ground-colour pale greenish or greyish white, profusely blotched, blotted, and streaked with darker and lighter shades of umber-brown, more or less confluent, in one case, at the larger, and in the other at the smaller end. Dimensions 0·7 by 0·5 inch, and 0·69 by 0·49 inch.

PASSERES.

Fam. LANIIDÆ.

Bill strong, deep, much compressed, with the culmen curved from the base to the tip, which is very deeply notched. Nostrils placed nearer the margin than the culmen; gape armed with stout bristles. Wings shorter or equal to the tail. Legs and feet short. Tarsus covered with stout shields. Outer and middle toes joined at the base; hind toe large.

Genus LANIUS.

Bill with the characters of the family. Nostrils round, protected by a few well-developed bristles. Wings rather short; the 2nd quill longer than the secondaries, and the 3rd and 4th the longest. Tail long and graduated, exceeding the closed wings by about their own length. Tarsus slightly longer than the middle toe with its claw.

LANIUS CRISTATUS.

(THE BROWN SHRIKE.)

Lanius cristatus, Linn. Syst. Nat. i. p. 134. no. 3 (1766); Jerdon, B. of Ind. i. p. 406 (1862); Walden, Ibis, 1867, p. 212; Swinhoe, P. Z. S. 1871, p. 375; Holdsworth, P. Z. S. 1872, p. 436; Hume, Nests and Eggs, i. p. 175 (1873); Str. Feathers, 1874, p. 198, et 1875, p. 91; Butler, ibid. p. 464; Armstrong, ibid. 1876, p. 316.

Lanius phœnicurus, Pall. It. iii. p. 693. no. 6 (1776); Prjevalski, B. of Mongolia, Rowley's Orn. Misc. vol. ii. p. 274 (1877).

Enneoctonus lucionensis, G. R. Gray, Gen. B. i. p. 291 (1845); Swinhoe, Ibis, 1864, p. 420.

Enneoctonus cristatus (Linn.), Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 167 (1854).

Lanius superciliosus (Lath.), Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 130.

Lanius lucionensis (L.), Blyth, Ibis, 1867, p. 304.

Otomela cristata, Schalow, Journ. für Orn. p. 130 (1875).

The Crested Red or Russet Butcher-bird, Edwards, Nat. Hist. Birds, pl. 54; *The Crested Red Shrike*, *The Woodchat Shrike*, *Rufous-tailed Shrike*, *Supercilious Shrike* (Latham); *Butcher-bird* in India.

Batti gadu, Telugu; *Curcutea*, Bengal. (on account of its harsh voice).

Adult male. Length 7·5 to 7·7 inches; wing 3·4 to 3·55; tail 3·0 to 3·2; tarsus 1·0; mid toe and claw 0·85; bill to gape 0·85.

Female. Length 7·4 to 7·6 inches; wing 3·4 to 3·5.

Iris dark brown, sometimes hazel-brown; bill with the upper mandible and tip blackish, gape and base of lower "fleshy;" legs and feet varying from bluish grey to blackish slate; claws darker than the toes.

Adult male (Colombo, Sept. 29, 1876). A broad facial streak from the nostril over the lores, and passing beneath the eye to the ear-coverts, *black*. Nasal plumes black; a more or less narrow frontal streak, widening as it passes over the eye to above the ear-coverts, white; forehead, crown, and nape brownish rufous, passing on the hind neck,

back, scapulars, lesser wing-coverts, and lower back into ashy brown, more or less, according to the individual, tinged with rufous; the change from the colour of the head to that of the hind neck always more or less marked; the brown of the rump passes on the upper tail-coverts into lighter rufous than the head; tail brownish rufous, the shafts of the feathers blackish and the tips albescent; wings brown, the median and greater coverts and the secondaries edged and tipped with rufescent fulvous; throat and lower face white; fore neck and under surface *whitish*, tinged with rufous-buff on the chest, sides of breast, flanks, and vent; under tail-coverts more strongly tinged with this colour than the throat, and the flanks most rufous of all; under wing concolorous with the chest.

Female. Differs from the male in having the eye-streak of less size and not so black; this streak is blackish brown, and only partially envelopes the lores, there being merely a small blackish spot in front of the eye.

Young. Birds of the year have the wing varying from 3·3 to 3·4 inches. Bill paler than in the adult; legs and feet bluish grey.

In the nestling or first plumage the feathers of the head and upper surface are rufescent fulvous, each with a dark terminal edging and ray across the centre; the wing-coverts are broadly margined with rufous, with an internal dark edge; the secondaries are similarly marked, the dark line being chiefly conspicuous at the tips of the feathers; eye-streak narrow, darker in the male than the female; beneath whitish, tinged with buff on the chest and flanks, and marked, except on the throat and belly, with crescentic rays of blackish brown. In the plumage worn by most of our new arrivals, the nestling-feathers on the upper surface have partly or entirely disappeared, and the new feathers are somewhat of the same hue as in the adult, only the back is just as rufous as the head, and is thus wanting in the brown distinctive character; the wing-coverts and secondaries are more or less broadly edged with fulvous, with the internal black edge and the under surface in all stages of marking, the crescentic edgings being of course chiefly confined to the chest and flanks (young females seem to be more tinged with buff than males on the chest); the supercilium is crossed with transverse lines. Some birds are much more advanced on the under surface than the upper, and *vice versâ*; but the last remnant of the immature plumage is always to be seen on the flanks. The young of this species, though very similar to, may, I think, be distinguished from those of *L. lucionensis* by being *rufous*-brown on the head, and by having a certain amount, more or less, of pale edging at the margin of the forehead. I have observed this to hold good in a large series of both species which I have examined. The amount of rufous on the crown as distinguished from the hind neck varies considerably in individuals.

Obs. The Ceylonese examples of this species are identical with those from India, as would naturally be the case when we consider that the species is migratory to both countries from beyond the Himalayas. Layard considered it to

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LANIUS LUCIONENSIS.

(THE GREY-HEADED SHRIKE.)

Lanius lucionensis, Linn. Syst. Nat. i. p. 135 (1766); Swinhoe, Ibis, 1860, p. 59, et 1863, p. 272; Walden, ibid. 1867, p. 215; Swinhoe, P. Z. S. 1871, p. 376; Hume, Str. Feath. 1873, p. 434, et 1874, p. 199.

Adult male and female. Length 6·5 to 7·0 inches; wing 3·5 to 3·65; tail 3·4 to 3·6; tarsus 0·9; mid toe 0·6, its claw (straight) 0·23; bill to gape 0·8.

These measurements are from a series of examples in the Swinhoe collection and a single example in my own from the S. Andamans. Hume gives the length of Andaman examples as attaining 8·25 inches, and the wing 3·75.

"Iris brown; upper mandible horny brown, edged whitish near the gape; the terminal line of the lower mandible horny brown, the basal two thirds bluish or fleshy white; legs and feet dull leaden blue, or dull bluish, or sometimes even greenish horny." (*Hume.*)

Male. Back, scapulars, and sides of neck earth-brown, passing gradually on the hind neck and crown into the greyish

be a variety of the Indian bird (which he styles *L. superciliosus*, the rufous-backed bird found in Java and Japan), being paler and wanting the rufous crown of that form; but he probably was dealing with immature specimens, which predominate in the island. Blyth (*loc. cit.*) referred these specimens of Layard's to *L. lucionensis*, the species dealt with below. Schalow and Swinhoe unite the Indian bird with Pallas's Shrike (*L. phœnicurus*) from Amoorland; and I think it is generally admitted now to be the same as the latter species. I have examined specimens of this bird in the Swinhoe collection, now in the possession of Mr. Seebohm, and also examples collected at Krasnoyarsk for this gentleman during June last year, and they are, both as regards young and adult, *identical* with my own from Ceylon. An immature bird from Lake Baikal (wing 3·3 inches) corresponds with one of my specimens; and three adults from Krasnoyarsk, in summer plumage, correspond precisely with examples in full winter plumage from Ceylon. They measure in the wing 3·4, 3·42, 3·5 inches; the extent of whitish grey on the forehead varies, as it also does in Ceylonese specimens.

Lanius superciliosus, which I take to be the species inhabiting Japan, is apparently nothing but a rufous race of *L. cristatus* with a more conspicuous white forehead and supercilium. It is slightly larger in the wing and tail, and is principally distinguished from the present bird by having the back and hind neck almost as rufous as the head, and the head itself, as also the rump, lighter rufous than in our species. Three specimens (Mus. Seebohm) from Yokohama measure—wings 3·6, 3·65, 3·65, tails 4·2, 4·2, 3·9 inches respectively. The tails too are crossed by obsolete dark rays. I may remark here that the figure of *L. phœnicurus* ('Ibis,' 1867, pl. v.) is in reality a representation of this bird, the hind neck being much too rufous, and the frontal band too broad for the former species.

L. isabellinus, which is apparently identical with *L. arenarius*, Blyth (Blanford, Zool. Persia, p. 140), is not very distant from the present species, much resembling it in summer plumage, when it becomes rufous on the head and rump. It may, however, as pointed out by Lord Tweeddale, in his excellent paper on the Rufous-tailed Shrike ('Ibis,' 1867), be distinguished from *L. cristatus* by its broader and less graduated tail. The old male has a white wing-bar extending from the 4th to the 9th primary.

The present species was named *cristatus* by Linnæus on account of the erroneous delineation of a crest in the figure on Edwards's plate. Though the coronal feathers in this section of the Shrikes are elongated, I do not think they are ever raised by the birds even when under the influence of emotion.

Distribution.—This Shrike is a very abundant species in Ceylon during the cool season. It arrives in the north in great numbers, the better part of which are immature birds, during the early part of September, and establishes itself in the islands off the Jaffna peninsula and on the adjacent mainland, considerably outnumbering the resident species, *L. caniceps*; thence it spreads over the whole island, inhabiting the east and west coasts in equal numbers; and ascending the hill-zone it takes up its quarters in many of the open valleys in the coffee-districts, and finds its way up to the Nuwara-Elliya plateau. It is very common on the

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of the forehead; on the hind neck there is generally a rufous shade, and the hue of the back is always slightly pervaded with grey; upper tail-coverts rufous-brown, passing into brown on the rump; wings liver-brown, the primaries with a faint rufous edging, and the secondaries and tertials rather broadly edged with fulvous; tail light rufous-brown, the margins lighter than the rest of the web; tips of the outer feathers pale.

Lores and a broad stripe through the eye and over the ears black, surmounted by a whitish supercilium blending into the brown of the head; chin, throat, and face white, passing into the rufous-buff of the chest and underparts; the centre of the breast and belly are generally paler than the flanks; in some examples, fully aged probably, the chest is uniform rufous right across, and the separation between it and the white of the throat plainly indicated: under wing pale rufous-buff and its edge white.

Female has the lore-spot much smaller and, together with the ear-stripe, less black than the male; underparts paler.

Young. After leaving the nest the young are brownish rufous above, brightest on the upper tail-coverts: the head concolorous with the back, and the forehead no paler than the crown, except just at the bill, where the bases of the feathers are more buff than further back; the whole upper surface, including the lesser wing-coverts, crossed with wavy bars of blackish; wings rich brown, the coverts, secondaries, and tertials broadly margined with rufous: primaries narrowly edged and tipped with a paler hue; tail brownish rufous, with a pale tip, which is preceded by a black edging: upper part of lores and an undefined stripe above the eye buff; lower part of lores

west coast, and is one of the best-known birds to ornithological observers in the cinnamon-gardens and similar open bushy grounds in the vicinity of Colombo. Further south it is not so plentiful in the wooded semi-cultivated country west of Tangalla as it is in the south-east of that place. In the low jungle-covered seaboard around Hambantota, and thence north, it is very common, as it also is in districts of similar character between Batticaloa and Trincomalie. Though not uncommon about Nuwara Elliya and Kandapolla, it does not seem to pass over the Totapella range on to the Horton Plains. In the coffee-districts it prefers the patnas to any other localities, and even frequents bushy situations at the top of such isolated peaks as Allegalla, on the summit of which I have met with it. Its departure from the island takes place at the latter end of April. I have seen it about Colombo until quite the end of that month. At Aripu Mr. Holdsworth gives the duration of its visit from October till April.

This species is spread throughout India during the cold season, leaving the country in the hot weather, although some are said to remain and breed in the north. Blyth even says that a few are found about Calcutta at all seasons. It is not recorded from the Travancore hills, nor from the Palanis, either by Mr. Bourdillon or Mr. Fairbank, and the latter says it is rare at Ahmednagar. In Chota Nagpur it is, says Mr. Ball, "common throughout." It extends to the eastward as far as Mount Aboo, where it arrives about the 1st of September, according to Capt. Butler. Mr. Hume remarks that Mount Aboo is quite on the confines of its distribution to the east; and, in fact, it is not recorded at all from Sindh nor the Sambhur-Lake district. Whether, in its migration northwards, it passes round the western end of the Snowy range seems to be not quite certain; for though Mr. Hume at first identified Dr. Henderson's Yarkand birds as this species, Dr. Scully, though he searched well for it, did not meet with it there, and was, moreover, assured by the Yarkandis that only one species, *L. arenarius*, inhabited that region. To the east of the Peninsula it is numerous. Mr. Hume writes that it is a cold-weather visitant to the Province of Tenasserim, and thence it is a straggler to the Andamans as well, though not found in the Nicobars. In Pegu it is, says Mr. Oates, "common during the greater portion of the year, coming in, however, in great numbers in September." The influx here spoken of, which affects the whole of the peninsula of India, is caused, doubtless, by a migration over the ranges to the eastward of the Himalayas, from Thibet, Mongolia, and perhaps Eastern Siberia. In these distant regions it chiefly breeds, leaving them in vast flocks to travel many thousand miles southwards

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and aural stripe dark brown, paler and less of it on the lores in the female: all the under surface buff-white, tinged with rich buff or rufous on the flanks; vent and under tail-coverts, and the sides of the neck, chest, and flanks crossed with crescentic markings of dark brown.

In what is probably the plumage of the second year the upper surface is a ruddy brown with a tinge of grey in it, the rump and upper tail-coverts rufous with blackish-brown bars, and the quills and wing-coverts less conspicuously edged; the forehead is still concolorous with the head, and the crescentic margins of the lower parts less pronounced and faded from off the chest. Some examples (for instance one shot in May) have the forehead pale, the upper surface pervaded with greyish, and yet the under surface well marked with the brown bars, but the sides of the chest and flanks have a rufous adult look about them.

In some instances these under-surface markings do not vanish for several years: a specimen before me is fully adult on the upper surface, but has most of the lower surface and even the sides of the neck crossed with brown pencillings; and out of twenty-three, adult as regards the forehead and back, *nearly half of them have some few bars on the flanks.*

Obs. I doubtfully include this species in our lists, not on the evidence of Blyth and Layard (for it appears to me that they were speaking of the race of *L. cristatus* as a whole, as exemplified in the birds which migrate to Ceylon), but on the testimony of Mr. Hume, who writes ('Stray Feathers,' 1873, p. 434) of *an adult* example received by him from Ceylon, of which he speaks as follows:—"An adult bird, with the grey-brown head and back and pale forehead of *lucionensis*, either belongs to that species or to a very closely allied one not yet discriminated."

I know of no other adult bird with the characters of *L. lucionensis* having been obtained in Ceylon. I cannot positively assert whether one or two immature specimens in my collection may not belong to this species, for, as I have said in my article on the last, the young of the two species are very similar; and though, as a rule, the head in the young *L. cristatus*, after getting beyond its nest-plumage, is more rufous than the back, this may not *invariably*

to its furthest limit, Ceylon. In the solitudes of Thibet it appears to be a resident throughout the year; for Col. Prjevalski writes that it "was observed throughout our travels, with the exception of Koko-nor, Tsaidam, and Northern Thibet. In those localities which we visited in winter, or early in spring, we found it most numerous in the Hoang-ho valley. In Ala-shan they breed in the sacsaulnics; and in Kan-su they generally inhabit the low wooded plains. The first migrants were seen to arrive in the Hoang-ho valley on the 28th of April. It breeds commonly in the woods of Ussuri country, especially in those localities where there are many decayed or felled trees." Swinhoe merely mentions it being found at Amoy, and that he had frequently received it from Trans-Baikal in full summer plumage. Père David is of opinion that it migrates from India to the borders of Lake Baikal and into the eastern parts of Siberia, as also into Southern China. It seems not unreasonable to doubt whether it performs such a stupendous journey as would be incurred in crossing the vast territory known as Mongolia, with its lonely deserts and lofty ranges of mountains, and thence through the scarcely less extensive region of Thibet, passing finally over the spurs of the Snowy ranges, and then spreading throughout the plains of India; and I would suggest that there is probably a double migratory stream—the one from Thibet and the Hoang-ho valley passing into India and Burmah, and the other from the Trans-Baikal region into China. As the *L. phœnicurus* of Pallas, it was, remarks Lord Tweeddale, met with first by this traveller in the month of June "amongst the rocks of the mountain of Adon-Scholo, near the river Onon in Dauria."

Habits.—This "Butcher-bird" frequents bushy land, uncultivated scrubby ground, hedge-rows, the borders of jungle, and all situations in which there are low trees and shrubs, on the tops of which it perches, flying from one to another, and repeatedly uttering its harsh cry. It is very querulous in its disposition; and there is no Ceylonese bird that I know of which gives one so much the impression of always being in a rage as this! On a sudden, when scarcely a bird-note is heard during the usual lull after the morning feed is over, one of these Shrikes will suddenly appear on the top of a cinnamon-bush, having flown up from the ground or from some low shrub, and commence screaming with all its might, whether by way of expressing its approbation of the flavour of the last lusty grasshopper that it has put an end to, or for the purpose of scolding its nearest fellow mate must be left to some one better versed in bird-language than I; but certain it is that the

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be the case. I have examples with heads almost as brown as those of the Philippine species. Mr. Hume observes, in his account of this species at the Andamans, that the bill is generally slightly longer than in *L. cristatus*; but this rule does not invariably seem to hold good.

Distribution.—Should this species visit Ceylon to a limited extent (and there is no reason why it should not, as it is found in the Andamans), it most probably strays over most of the low country. Mr. Hume does not mention from what district his specimen came. It was originally described from Luzon, one of the Philippines, whence it was brought by Poivre. Lord Tweeddale writes that "it migrates to North China during the spring, and returns south to the Philippines at the close of summer, many in their passage resting in Formosa, and some, according to Mr. Swinhoe's latest observations, passing the winter in that island. He also observed it passing over at Hong-Kong in the spring, and found it at Talien Bay, North China, during the end of June, where it, however, became much scarcer towards the middle of July." It must breed in China, for Swinhoe remarks (P. Z. S. 1871) that "those collected on the passage through Formosa were all immature, as if they had not strength to make the through voyage to the Philippines without rest." In the Andamans many immature birds no doubt remain during the cool season, for Mr. Hume says it appears to be a permanent resident in those islands. It was found in this group at Port Blair, and at Camorta in the Nicobars. In Tenasserim it is a "straggler to the southern extremity of the Province," and must of necessity occur there on its passage westward from the adjacent north-eastern portion of the continent. An example of a Shrike, similar to that sent to Mr. Hume from Ceylon, is recorded by this gentleman as having been obtained in the Travancore hills in February; it was nearly adult; and this, at such a season of the year, is such an extraordinary occurrence that it fosters the belief already expressed of its being perhaps a new and not yet discriminated species.

Habits.—Mr. Davison remarks that the habits of this Shrike do not differ from *L. erythronotus*; it kept to gardens in the Andamans and was very silent. Swinhoe, however, says that it has a sweet song.

said companion very soon appears on a neighbouring bush and vies with him in creating a general disturbance! There is this much to be said, that it is more noisy when it first arrives than after it has settled down in its new quarters; and is it to be wondered that after *such* a journey it should desire to proclaim its safe arrival? It is a restless bird, continually on the move, and is very difficult to come within range of, as directly it perceives that it is being approached it flies off to another perch. I have often seen it on the ground pursuing grasshoppers by darting at them as they fly out of the grass, and have noticed it proceeding across a road with prodigious hops and very erect carriage. Although its food is almost entirely insectivorous, it is occasionally guilty of the crime which has acquired for its family the name of "Butcher-birds," as Mr. Bligh informs me that he has known it to impale a White-eye (*Zosterops ceylonensis*) after the manner of the European species. It never takes long flights while resident, merely proceeding from the top of one bush to another; and during the winter season its note consists of nothing but the harsh chattering above mentioned. Blyth says that it warbles very sweetly at the end of the cold season at Calcutta.

Nidification.—I am unable to give my readers any further particulars touching the nesting of this bird than those already contained in my extract from Colonel Prjevalski's notes. That it does not breed in India is evident, although Tickell was led to suppose that it did so. The nest and eggs described by him were evidently those of a Bulbul.

LANIUS CANICEPS.

(THE RUFOUS-RUMPED SHRIKE.)

Lanius caniceps, Blyth, J. A. S. B. 1846, xv. p. 302; id. Cat. B. Mus. A. S. B. p. 151 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 164 (1854); Fairbank, Str. Feath. 1877, p. 400.

Lanius tephronotus (Vig.), Kelaart, Prodromus, Cat. p. 124 (1852).

Lanius erythronotus (Vig.), Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 130; Jerdon (in pt.), B. of Ind. i. p. 402 (1862); Holdsw. P. Z. S. 1872, p. 436; Legge, Str. Feath. 1876, p. 243.

Collyrio caniceps (Bl.), Hume, Nests and Eggs, i. p. 169 (1873).

Lanius affinis, Legge, Str. Feath. 1876, p. 243.

Pale Rufous-backed Shrike of some; *Butcher-bird*, Europeans in north of Ceylon.

Adult male. Length 9·0 to 9·2 inches; wing 3·55 to 3·65; tail 4·5; tarsus 1·05; mid toe and claw 0·95; hind toe and claw 0·75; bill to gape 0·9.

Adult female. Length 8·7 to 8·9; wing 3·45 to 3·6; tail 4·1 to 4·3.

Iris hazel-brown; bill black; legs and feet blackish brown.

A broad facial band encompassing the eye, and passing from below the ear-coverts to the nostril and across the forehead, where it narrows, wings, and three central pairs of tail-feathers black; head, back and sides of neck, back, and scapulars pale bluish grey, with a whitish edging at the frontal band and above the eye; edge of the wing and a band at the base of the primaries from the 5th to the 10th quill, under wing, throat, fore neck, and centre of breast white; rump, upper tail-coverts, and flanks rufous; under tail-coverts and *terminal portion of the longer scapulars* rufescent, or paler than the rump.

In abraded plumage the head and edges of the back-feathers become whitish; and I observe that when the plumage is new the longer scapulars are more rufous than when it is abraded, as this colour is chiefly confined to the external portion of the webs.

Female. Has the eye-stripe or band less black than the male, and the frontal bar narrower.

Young. (Nestling shot by Mr. Holdsworth, 8th February, 1869.) Above pale sandy fulvous, darkening gradually into rufous on the rump, longer scapular-feathers, and upper tail-coverts; on the hind neck a slight tinge of greyish; all the feathers barred with wavy marks of dark brown; lesser wing-coverts rufescent, broadly barred with blackish brown; inner webs of the tertials rufous, their external margins and tips of the same colour; four central tail-feathers brown, the remainder and the tips of the first-named rufous tinged with brown; eye-band blackish brown, not extending to the forehead; beneath whitish, tinged with rufescent strongly on the flanks and under tail-coverts.

Obs. This fine Shrike is the southern representative of *Lanius erythronotus*, the Rufous-backed Shrike, found in the Deccan, Central and Northern India. Specimens from Malabar and from the Godaveri-river district have just as little rufous on the scapulars and lower back as our birds; in fact a Malabar example in the national collection has less rufous on these parts than some Ceylonese specimens. Two birds from the districts named measure 3·5 and 3·75 inches in the wing, and two from the Palanis, obtained by Mr. Fairbank, 3·3. At the time I wrote my note on this species ('Stray Feathers,' 1876) I had only specimens of *L. erythronotus* in my collection, and was unacquainted with the true *L. caniceps*, and hence my remark as to our bird perhaps being a local race of the former. The Rufous-backed Shrike has the back as far up as the interscapulary region, and nearly all the scapular tuft, rufous; and in all specimens I have examined there is an absence of the pale margin at the posterior edge of the frontal band; the secondaries and tertials are more broadly edged with fulvous than in *L. caniceps*. Two examples from Behar measure 3·5 and 3·4 inches in the wing, and two from Futteghur 3·5 and 3·55 respectively.

As our species was entered as *L. tephronotus* in Kelaart's Catalogue, it may not be out of place to mention, for the information of my Ceylon readers, that this Shrike is a very distinct bird from either of those in question. It is a large bird, with the wing varying from 3·9 to 4·3 inches, and the tail about 5¼; dark grey on the head and back, with the rump and upper tail-coverts dusky rufous; the wings and tail not so black, but the under surface much as in *L. caniceps*.

Distribution.—This large Butcher-bird inhabits the Jaffna peninsula, the extreme north of the Vanni, and the whole of the N.W. coast, from Poonerin to the country between Chilaw and Puttalam, including the islands of Manaar and Karativoe. On the Erinativoe Islands I did not observe it. It does not seem to extend far inland, although it is very abundant on the sea-board. It has been procured by Mr. Hart on the Puttalam and Kandy road as far up as Nikerawettiya; westward of that about Kurunegala, in the Seven Korales, and in the region along the base of the west Matale hills I searched diligently for it without success. In the Jaffna peninsula it is chiefly abundant about Point Pedro. In the island of Manaar, and on the open bushy plains of the adjacent coast as far south as Pomp-Aripu, it is abundant. Southward of this place its numbers diminish; and no example has ever, to my knowledge, been *procured* south of Chilaw, although I observe that Mr. Holdsworth is of opinion that he saw it occasionally in the cinnamon-gardens at Colombo. The foregoing species is very common in that locality, but the present bird has not yet been obtained there up to the date of my latest advices from the Colombo museum.

On the continent the Rufous-rumped Shrike is found in the south of India and up the east coast as far north as the Godaveri river. I do not observe that it has been found either by Messrs. Fairbank or by the authors of the recent contribution to the avifauna of the Deccan, Messrs. Davidson and Wender, in this region. Mr. Ball likewise does not record it from the coast region north of the Godaveri. It would appear, however, that it has been found in Cashmere and in Afghanistan—that is, if Blyth's identification of Captain Hutton's specimens was correct. As late as 1873 Mr. Hume incorporates the latter gentleman's notes on its nesting in that region in 'Nests and Eggs;' and I therefore infer that he considers the identification correct. It is also found in the N.W. Himalayas; but from intermediate localities, such as Sindh, Guzerat, Sambhur, or the neighbourhood of Futteghur, it does not appear ever to have been recorded. Jerdon writes of this species, in his 'Illustrations of Indian Ornithology,' 1847, at a time when he considered it distinct from *L. erythronotus* (for in his 'Birds of India' he unites the two), that though "occasionally found in the more wooded parts of the country in the Carnatic, it is only common in the neighbourhood of the jungles of the west coast, and is very abundant on the top of the Nilghiris." Mr. Fairbank says that it is resident on the summit of the Palani ranges and breeds there.

Habits.—In its mode of living the present species resembles the remainder of this interesting family. It frequents low thorny jungle, scrubby land, and open places near the sea-coast, which are dotted here and there with clumps of low trees and bushes. When not engaged in catching its prey it seems to pass most of its time on the top of a shrub, uttering its harsh cry as if it were on bad terms with all its neighbours. It is very noisy in the mornings and evenings, flying about from bush to bush, and is so restless that it is very difficult to approach. There is in its disposition evidently that dislike for the presence of man that characterizes all its congeners with which I am acquainted; and it decidedly disapproves of his endeavouring to make acquaintance with its habits by even presuming to watch its movements, for as soon as it observes that it is an object of interest it immediately decamps. It feeds on grasshoppers, which it entraps on the ground, and also preys on Mantidæ and dragonflies.

Nidification.—This bird breeds in the Jaffna district and on the north-west coast from February until May. Mr. Holdsworth found its nest in a thorn-bush about 6 feet high, near the compound of his bungalow, in the beginning of February. He describes it as cup-shaped, made of rather slender twigs, and lined with roots. Unfortunately the young were just fledged at the time he discovered it, and he therefore obtained no information as to the eggs of the species. Layard speaks of the young being fledged in June at Point Pedro, and says that it builds in *Euphorbia*-trees in that district.

Referring to Mr. Hume's 'Nest and Eggs,' I find it recorded that the breeding-season of this Shrike in South India extends from March until July. Concerning its nesting in the Nilghiris, Mr. Wait writes:—

"The nest, cup-shaped and neatly built, is placed in low trees, shrubs, and bushes, generally thorny ones; the outside of the nest is chiefly composed of weed (a white downy species is invariably present), fibres, and hay, and it is lined with grass and hair. There is often a good deal of earth built in with roots and fibres in the foundation of this nest. Four appears to be the usual number of eggs laid." Mr. Davison's account of its nesting is as follows:—"This species builds in bushes or trees at about 6 to 20 feet from the ground. A thorny thick bush is generally preferred, *Berberis asiatica* being a favourite. The nest is a large, deep, cup-shaped structure, rather neatly made of grass mingled with old pieces of rag, paper, &c., and lined with fine grass. The eggs, four or five in number, are white, spotted with blackish brown chiefly at the thicker end, where the spots generally form a zone." Mr. Hume remarks that the eggs are undistinguishable, in many instances, from those of its close ally *L. erythronotus*, though they vary less and average longer. In length they range from 0·93 to 1·0 inch, and in breadth from 0·7 to 0·72 inch; but the average of twenty was 0·95 by 0·7 inch.

PASSERES.

Fam. DICRURIDÆ.

Bill stout, both wide and high at the base, the upper mandible moderately curved, and the tips of both mandibles notched; gape armed with stout bristles. Wings moderately long. Tail of 10 feathers only, forked, and with the lateral feathers occasionally much lengthened. Legs short; feet rather small.

Plumage black. Sternum with a tolerably large foramen in each half of the posterior edge (*Chibia hottentota* and *Bhringa remifer*).

Genus BUCHANGA.

Bill stout, broad at the base, the upper mandible high; the culmen keeled and well curved to the tip, which, as well as that of the under mandible, has a distinct notch. Nostrils oval, small, concealed by the impending plumes. Rictal bristles long and stout. Wings pointed; the 4th quill the longest, the 2nd subequal to the 7th and twice as long as the 1st. Tail long, deeply forked, and expanding at the tip. Tarsus longer than the middle toe, protected with stout transverse scutæ. Feet rather small and stoutly scaled; hind toe and claw large.

BUCHANGA ATRA.

(THE BLACK DRONGO.)

Muscicapa atra, Hermann, Obs. Zool. p. 208 (1804).

Dicrurus macrocercus, Vieill. N. Dict. ix. p. 588 (1817); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 129; Jerdon, B. of Ind. i. p. 427 (1862).

Buchanga albirictus, Hodgs. Ind. Rev. i. p. 326 (1837); Hume, Nests and Eggs, p. 186 (1873); Butler, Str. Feath. 1875, p. 465.

Edolius malabaricus!, Kelaart, Prodromus, Cat. p. 124 (1852).

Dicrurus minor, Blyth, Cat. B. Mus. A. S. B. p. 22 (1849); id. Ibis, 1867, p. 305.

Dicrurus longus (Temm.), Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 152 (1854).

Buchanga minor (Bl.), Holdsw. P. Z. S. 1872, p. 438; Legge, Str. Feath. 1875, p. 202.

Dicrurus albirictus (Hodgs.), Hume, Str. Feath. 1875, p. 97.

Buchanga atra, Sharpe, Cat. B. iii. p. 246 (1877).

Le Drongolon, Levaill. Ois. d'Afr. iii. pl. 174.

The Drongo-Shrike of some; *King-Crow*, "*Flycatcher*," Europeans in Ceylon.

Kolsa, Hind.; *Finga*, Bengal.; *Japal kalchit*, Punjab; *Kunich* in Sindh; *Thampal*, N.W. Prov.; *Kotwal*, Natives in Deccan; *Yeti-inta*, also *Passala-poli-gadu*, lit. "Cattle Tom-bird," Telugu; *Kurri kurumah*, Tam., Jerdon.

Kari kuruvi, Tamils in Ceylon; *Pastro barbeiro*, Portuguese in North Ceylon.

Adult male and female. Length 10·75 to 11·1 inches; wing 5·0 to 5·45; tail 5·1 to 5·7, depth of fork 2·1; tarsus 0·8 to 0·85; mid toe and claw 0·82 to 0·9; bill to gape 1·05 to 1·15.

Males slightly exceed females in size.

Iris dull red, or brownish red in not fully adult birds; bill black; legs and feet black.

Above and beneath metallic blue-black; quills brown-black, glossed on the tail with green; lower surface of quills brown; a small white spot at the lower corner of the gape, not perceptible in many specimens until the black feathers round it be lifted up; in some it consists of a single feather.

Young. Birds of the year have the wing from 4·8 to 5·0 inches.

Iris reddish brown; bill and feet as in adult.

Above glossed as in the adult; beneath, from the chest, the feathers are fringed with white, coalescing into whitish on the abdomen; under tail-coverts and primary under wing-coverts with white terminal bars; greater under wing-coverts with a white spot at the tips. This plumage is acquired after doffing the nestling dress, which is brownish beneath, with similar white markings. After the next moult the white tips are present in the longer under tail-covert feathers, and sometimes on the under wing, this latter part losing the spots first, as a rule.

Obs. The Ceylon birds form a small race of this widely-spread species, and have been usually separated as *B. minor*: I cannot, however, keep our bird distinct as a subspecies even, for I find an example in good plumage in the British Museum from Behar which is no larger than fine specimens from Jaffna. It measures in the wing 5·5, tail 6·3, and has a small rictal spot. The generality of Indian specimens are, however, larger than this. Several from Nepal measure 6·0, 6·1, and 6·2 in the wing, and about 7·0 in the tail. In Burmah they are similar in size to those in the Himalayan subregions. The Black Drongo of China and Formosa (*B. cathœca*) is united by Mr. Sharpe with *B. atra*; and, I think, justly so too, for I can see no difference whatever between specimens in the British Museum from either of these localities and those from Nepal and Burmah. An example from Formosa measures—wing 5·7, tail 6·5; one from China—wing 6·2, tail 7·0. I find the white rictal spot present in these, although it is very minute, and it likewise exists in all Indian specimens I have examined. South-Indian birds

are usually about the size of the above noticed Behar example. I notice that in some instances the young of continental birds have a great deal of white near the edge of the under wing; but in this respect Ceylonese examples vary too, though apparently not quite to the same extent as the former.

Distribution.—This Drongo has a very singular distribution in Ceylon, which, as in the case of the Red-legged Partridge, leaves the impression that it had found its way, at some remote period, to the island, and, not liking it, had determined not to continue its explorations much beyond the point of its arrival! It is confined to the Jaffna peninsula and the north-west coast, down as far south as Puttalam, perhaps occurring as a straggler about Colombo, though it is certainly not resident there. I never saw it anywhere on the west coast south of the above-mentioned town, though I searched most diligently for it at Chilaw, a locality which I was prepared to find it in, as the conditions of climate and vegetation are those of the more northern parts which it frequents. Layard writes of it:—"*D. minor* is common about Colombo, frequenting natives' gardens." This is the habit of *B. leucopygialis*, and there must have therefore been a wrong identification here. Mr. Holdsworth says, "it is also found about Colombo, but by no means commonly within my experience." No specimens were procured by him there as I understand, and it is possible that the above-mentioned bird may have been mistaken for it. Others have been on the look-out for it for years past, but have not yet seen it in the Colombo district; and this is, therefore, one of the points in the island distribution of this bird which requires settling. There is no reason why it should not stray down the coast to Colombo; and if Mr. Holdsworth's identification of the bird at large were correct, it was most likely as a wanderer to the district that it made its appearance there. It does not seem to pass down the east coast at all. I have seen it near Elephant's Pass, but did not meet with it on the sea-board south of that, though it may occur at Mullaitivu. In the island of Manaar, on the open plains near Salavatori and to the north of Mantotte, it is very common, but it does not appear to take to the paddy-lands of the interior.

On the continent, the "Common King-Crow" is found, according to Jerdon, throughout the whole of India, extending through Assam and Burmah into China, and is to be met with in every part of the country, except where there is dense and lofty jungle. Commencing at the north-western limit of this wide range, I find that Mr. Ball observed it on the lower parts of the Suliman hills, and Mr. Hume procured it in Sindh; Captain Pinwill collected it in the N.W. Himalayas; Dr. Hinde at Kamptee; Messrs. Adam and Butler speak of it as common in the Sambhur-Lake district and in Northern Guzerat, though it is scarce, according to the latter gentleman, in the Mount-Aboo range. It is "very abundant in Chota Nagpur" (*Ball*), and also, further south, in the Deccan and the Carnatic. Mr. Fairbank found it common at the base of the Palanis and on the plains, but not at any elevation on the hills themselves. It is spread throughout the country to the south of this district as far as the island of Ramisserum. Turning to the north-east again, we trace it through north-eastern Cachar, where it is "extremely common" (*Inglis*) to Burmah, in which country Mr. Oates says that for many months of the year it is very abundant, being rare, however, from April to September. He did not see it on the Pegu hills. In Tenasserim Mr. Hume writes that it does not occur east of the Sittang. South of Moulmein it is not rare, and it extends to the Pakchan river. Concerning the country which forms the eastern limit of its range, namely China, Mr. Swinhoe writes (P. Z. S. 1871) that it is found throughout it, including the peninsula of Hainan and the island of Formosa; southward it extends into Siam, and thence across to Java, where it is the *Edolius longus* of Temminck.

Habits.—In Ceylon this Drongo frequents open lands, tobacco- and pasture-fields, bushy plains, and scattered thorny jungle on the outskirts of the latter. It is, like the rest of its genus, a tame bird, and is frequently to be seen sitting quietly on the backs of cattle or on the tops of fences near the bungalows in Jaffna, until a passing beetle attracts its notice, and it darts suddenly after it; sometimes a long chase occurs, and when the hapless insect is captured, it is dispatched on the nearest fence or tree, and the watch again commences. It often alights on low eminences on the ground, such as the top of a rut or a similar projection; and when frightened from this flies along close to the earth with a buoyant flight, and generally alights on a fence or low bush. It is usually solitary, or associates, perhaps, with one or two of its fellows in scattered company; but in close company I have not noticed it often. Its principal food consists of Coleoptera, grasshoppers, winged termites, of which it is very fond, and ticks, which latter it takes from cattle. It was the

species referred to by Layard when, in writing of *B. longicaudata,* he remarked that it perched on the backs of cattle to seek for ticks, on which it largely fed. Its flight is undulating and buoyant; and when chasing its prey it is capable of performing very rapid evolutions, darting hither and thither, and rising and falling until it has succeeded in its pursuit. Its note is more melodious than that of the rest of its congeners in Ceylon.

Dr. Jerdon has the following complete account of its habits in India:—"It feeds chiefly on grasshoppers and crickets, which, as Sundevall remarks, appear to be the chief insect-food for birds in India; also now and then on wasps or bees (hence the Bengal name), on dragonflies, and occasionally on moths or butterflies. It generally seizes its insect-prey on the ground, or whips one off a stalk of grain, frequently catching one in the air; now and then, when the grasshopper, having flown off, alights in a thick tuft of grass, the King-Crow soars for a few seconds over the spot like a Kestrel. When it has seized an insect, it generally, but not always, returns to the same perch. On an evening, just about sunset, it may often be observed seated on the top of a tree, taking direct upward flights, and catching some small insects that take wing at the time. Like most other birds, when a flight of winged termites takes place, it assembles in numbers to partake of the feast.

"The King-Crow obtains his familiar name in this country from its habit of pursuing Crows, and also Hawks and Kites, which it does habitually, and at the breeding-season, especially when the female is incubating, with increased vigilance and vigour. If a Crow or Kite approach the tree in which the nest is placed the bold little Drongo flies at them with great spirit and determination, and drives them off to a great distance; but although it makes a great show of striking them, I must say that I have very rarely seen it do so; and certainly I have never seen it fix on the back of a Hawk with claws and beak for some seconds, as Mr. Phillipps asserts that he has seen. Occasionally others will join the original assailant, and assist in driving off their common enemy."

A correspondent in 'Stray Feathers,' Mr. Wender, writing from Sholopoor Deccan, says:—"On the 8th inst. (Jan.) I saw a King-Crow (*B. albirictus*) sitting on a telegraph-wire with a lizard about 6 inches long in its claws, pecking away at it, just as you see a Hawk eating a lizard or a mouse. The lizard, one of those fragile light-coloured little fellows which one sees running about in long grass, was not quite dead, though he had ceased to struggle violently. The bird appeared to be pulling the lizard's intestines out in a most deliberate manner."

Some very interesting details concerning this well-known bird are furnished by Mr. Ball in his excellent paper on the Birds of Chota Nagpur. Referring to Dr. Jerdon's doubt as to its striking other birds, he says:—"On one occasion, however, I saw one actually carried on the back of a large Owl (*Ascalaphia bengalensis*) which flew out of a tree where it was being tormented by these birds and Pies (*Dendrocitta rufa*). In illustration of the somewhat miscellaneous character of the food of these birds I may mention that I remember one day in Calcutta opening a verandah *chick* (curtain) which had not been in use for some time, thus disturbing a colony of Bats that had made the inside coils their home; out they flew into the daylight, when they were immediately seen and hawked up by some King-Crows, who took them to neighbouring trees, where they quietly devoured them . . . . Late as they are in going to roost they are generally the first birds to be on the move in the morning. I have frequently heard them calling to one another long before dawn, when I have been travelling in the hot weather."

Nidification.—I was unable while in Ceylon to obtain any information from my correspondents at Jaffna concerning the nesting of this species. A comparison of its eggs with those of the continental form would be extremely interesting, and the matter is one which future workers in the island should pay attention to. In India, May, June, and July are said to be the favourite months for nesting, although eggs are occasionally taken in April and August. Mr. Hume writes that it usually builds pretty high up in tall trees, in some fork not quite at the outside of the foliage, "constructing a broad shallow cup, and lays normally four eggs, although I have found five." The nests "are all composed of tiny twigs and fine grass-stems, and the roots of the *khus-khus* grass, as a rule, neatly and tightly woven together, and exteriorly bound round with a good deal of cobweb, in which a few feathers are sometimes entangled; the cavity is broad and shallow, and at times lined with horsehair or fine grass, but most commonly only with *khus.* The bottom of the nest is

very thin, but the sides, or rim, rather firm and thick . . . . The variation in this bird's eggs is remarkable; out of more than one hundred eggs nearly one third have been pure white; and between the dead glossless pure white egg and a somewhat glossy, warm, pink-grounded one with numerous spots and specks of maroon colour, dull red, and red-brown, or even dusky, every possible gradation is to be found: each set of eggs, however, seems to be invariably of the same type, and we have never yet found a pure white and a well coloured and marked egg in the same nest." These latter "are a pale salmon-colour, spotted with rich brownish red." The average of 150 eggs was 1·01 by 0·75 inch, the smallest measuring 0·95 by 0·7 inch; the latter dimensions would be quite equalled, if not exceeded, by those of our Ceylonese birds.

BUCHANGA LONGICAUDATA.

(THE LONG-TAILED DRONGO.)

Dicrurus macrocercus, Jerd. Cat. B. South India, Madr. Journ. 1839, x. p. 240 (*nec* Vieill.).

Dicrurus longicaudatus, "A. Hay," Jerd. Madr. Journ. 1845, xiii. pt. 2, p. 121; Blyth, Cat. B. Mus. A. S. B. p. 202 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. p. 152 (1854); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 129; Bourdillon, Str. Feath. 1876, p. 394; Jerd. B. of Ind. i. p. 430 (1862); Hume, Str. Feath. 1875, p. 97.

Buchanga longicaudata, Walden, Ibis, 1868, p. 316; Holdsw. P. Z. S. 1872, p. 438; Hume, Nests and Eggs (Rough Draft), p. 189 (1873); Legge, Str. Feath. 1875, p. 202; Sharpe, Cat. B. iii. p. 249.

Buchanga waldeni, Beav. Ibis, 1868, p. 497.

King-Crow, Europeans in India and Ceylon.

Nil finga, Beng.; *Sahim* or *Sahem Pha*, Lepchas; *Chéchum*, Bhot.

Erratoo valan kuruvi, Tam., lit. "Double-tailed bird;" *Pastro barbeiro*, Portuguese in Ceylon.

Adult male and female. Length 10·5 inches; wing 5·0 to 5·4, average dimensions of wing in males procured in Ceylon 5·2; tail 5·8 to 6·0, depth of fork about 2·0; tarsus 0·7; mid toe 0·55 to 0·6, claw (straight) 0·3 to 0·33; bill to gape 1·1 to 1·12.

The above dimensions are from examples killed in Ceylon; an immature female shot in Ramisserum Island measures only 4·8 in the wing; one procured by Mr. Bourdillon in Travancore 5·4; a second 5·0. The measurement of a third, of which the sex is not stated, is given at 5·55.

Iris red, in some almost scarlet; bill, legs, and feet black.

Above metallic bluish black with a grey tinge on the back, increasing towards the upper tail-coverts; quills and tail with a strong greenish lustre on the outer webs, the inner being brownish black; beneath dull black pervaded with greyish, which hue is strongest on the breast, flanks, and abdomen; a slight steel-blue gloss on the chest; under wing-coverts greyish black; under surface of quills near the base brownish.

Young. Iris brownish red. The immature or bird of the year has the lower parts greyer than in the adult; the under tail-coverts have deep white tips in the form of terminal bars; beneath the carpal joint the feathers are also tipped with white, and the under wing-coverts have terminal spots of the same. The white markings, as in the case of *B. atra*, leave the under wing-coverts first; they seem to remain on the under tail-coverts until the bird is almost mature, as few specimens which I have seen are entirely without them; immature examples occasionally have one more white spot at the tips of the tail-feathers.

Obs. This is a variable species in size. Probably the birds which visit us in the cool season are bred in the south of India, and are consequently smaller than those from the northern parts of the Empire. A male, however, in the national collection from Darjiling has the wing 5·62 inches, tail 6·4, dimensions not much exceeding those which visit Ceylon.

Allied forms inhabit Burmah and the sub-Himalayan district, and were united by Jerdon with the present. *B. cineracea*, from the former region, is a smaller bird than the present species and much paler, being "ashy grey" above, and the same, but somewhat duskier, beneath; wing 4·9 to 5·2 inches. *B. pyrrhops* is, according to Mr. Sharpe, a good subspecies of the above, being larger than it. Mr. Hume considers it to be merely a grey form of *B. longicaudata*.

Distribution.—This species arrives in the north of Ceylon about the middle or latter part of October. It is decidedly migratory, as no individuals are seen between April and September, and at the season of its appearance it is always first met with on the seashore. At Trincomalie I noticed it in the Fort when it first arrived; it lingered about the neighbourhood and then betook itself to the jungles, through which it is diffused in tolerable numbers as far south as the Seven Korales. It does not appear to be common in the north. I have seen one or two individuals from the Jaffna district, but I did not meet with it on the north-

west coast, nor does Mr. Holdsworth appear to have done so. It is therefore singular that it should be a common species on the opposite side of the island. It is an occasional visitant to the west coast: I once noticed an example in October in the Fort at Colombo, but it quickly disappeared into the interior. Mr. Holdsworth likewise met with it in that district, obtaining a specimen about sixteen miles from Colombo. Further south on this side of the island it is unknown. I have seen it in the Wellaway Korale; and Mr. Bligh writes me of a Black Drongo which frequented his estate in Haputale in the month of November, which must have belonged to this species. Other evidence than this of its ascending the hills I have never obtained.

This Drongo inhabits the whole of the Indian peninsula. Jerdon writes of it:—"The Long-tailed Drongo is found wherever there is lofty forest jungle, from the Himalayas to Travancore . . . . I have killed it in Malabar, the Wynaad, Coorg, and the Nilghiris; it is found occasionally about Calcutta and all along the Himalayas up to 8000 feet of elevation. It is tolerably common at Darjiling." Captain Hutton says that it is the only species of Drongo which visits Mussourie, arriving from the Dhoon in the middle of March. Captain C. H. Marshall records it from Murree. In the south of India it appears to be a permanent resident. Mr. Bourdillon remarks that it is common in Travancore, and, as I have remarked, it is probably from there that it visits Ceylon; but why it should arrive so frequently on the east coast is somewhat puzzling.

Mr. Fairbank records it from Khandala, and says that it is rarely found in the Ahmednagar district. Jerdon remarks that Adams found it common in Cashmere, which must be its extreme limit to the north and west.

Habits.—Heavy jungle and forest are the localities principally frequented by this Drongo, the vicinity of open places, banks of rivers, or margins of secluded tanks being usually chosen by it in which to take up its quarters; and there it subsists on the insectivorous diet so rife in the tropical woods. It perches on the tops of tall trees or on some outstanding branch, from which prominent outlook it sallies forth on the beetles and various winged insects which pass it, and then returns to its post to discuss the prey thus captured. It is an inquisitive and somewhat querulous species, chasing Hawks and Crows, and not unfrequently consorting with Bulbuls and other small birds for the purpose of mobbing an unfortunate Owl which has been discovered abroad during the daylight. I have more than once found it pursuing the Devil-bird. On first arriving in the island it is found in avenues and groves of trees near human habitations, but it soon disappears for its sylvan haunts. It is often noticed on the edges of roads leading through the forest, and may easily be recognized from other Drongos by its long tail and generally slender outline. It is one of the last birds to retire in the evening, and often makes a supper off the beetles, termites, bugs, &c. which are abroad during the short twilight of the tropics. Its notes are varied and shrill in tone, and some of them are cleverly imitated by the Common Green Bulbul, *Phyllornis jerdoni*. I have usually met with it in pairs, but once or twice have seen a small party together. Jerdon remarks that it now and then makes a considerable circuit, apparently capturing several insects, before returning to its perch, and then reseating itself on some other tree; he likewise states that three or four are sometimes seen together in scattered company, but that each returns independently to its own perch. Layard's remarks as to this Drongo perching on the backs of cattle apparently apply, as heretofore remarked, to the Black Drongo so common in the open about Jaffna.

Nidification.—This species breeds in India during the months of March, April, and May, building, according to Captain Hutton, a very neat nest, usually placed on the bifurcation of a horizontal branch of some tall tree. "It is constructed of grey lichens gathered from the trees and fine seed-stalks of grasses firmly and neatly interwoven; with the latter it is also usually lined, although sometimes a black fibrous lichen is used; externally the materials are kept together by being plastered over with spiders' webs." There are, says Mr. Hume, two types of this bird's eggs—the one of a pale pinkish salmon-coloured ground, streaked, blotched, and clouded somewhat openly, except at the large end, with reddish pink; the other has a pale pinkish-white ground, blotched boldly, almost exclusively, at the larger end in a broad irregular zone with brownish red. They vary from 0·85 to 1·01 in length by from 0·7 to 0·75 inch in breadth.

BUCHANGA LEUCOPYGIALIS.

(THE CEYLONESE WHITE-BELLIED DRONGO.)

(Peculiar to Ceylon.)

Dicrurus leucopygialis, Blyth, J. A. S. B. 1846, xv. p. 298; id. Cat. B. Mus. A. S. B. p. 203 (1849); Kelaart, Prodromus, Cat. p. 124 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 130; Blyth, Ibis, 1867, p. 306; Legge, ibid. 1874, p. 16.

Dicrurus cœrulescens (Linn.), Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 129.

Buchanga leucopygialis (Bl.), Holdsworth, P. Z. S. 1872, p. 439; Hume, Str. Feath. 1873, p. 436; id. Nests and Eggs, i. p. 192 (1873); Legge, Ibis, 1875, p. 288; Sharpe, Cat. B. iii. p. 253 (1877).

Buchanga cœrulescens (Linn.), Holdsw. P. Z. S. 1872, p. 439 (in pt.); Legge, Ibis, 1875, p. 288; id. Str. Feath. 1875, p. 202 (in pt.).

Buchanga insularis, Sharpe, Cat. B. iii. p. 253 (1877).

The King-Crow, Europeans in Ceylon. *Pastro barbeiro*, Portuguese in Ceylon.

Kowda or *Kawuda Panika*, Sinhalese.

Ad. niger, chalybeo nitens, abdomine albicante, crisso et subcaudalibus albis: rostro et pedibus nigris: iride rubrâ.

Adult male. Length 9·5 to 9·9 inches; wing 4·7 to 4·95; tail 4·7 to 5·1; tarsus 0·75 to 0·8; mid toe 0·7, claw (straight) 0·24; bill to gape 1·0 to 1·1.

Adult female. Length 9·5 to 9·7 inches; wing 4·5 to 4·75; tail 4·5 to 4·75.

Iris varying from reddish brown to brownish red, in some obscure red; bill, legs, and feet black.

Obs. These measurements and the colours of the soft parts are taken from a series of northern and southern examples, the representatives of the two types into which this species apparently divides itself; but in order to the more complete insight into the question, I will in my "descriptions" first deal with one type, and then pass through the intermediate form to the other.

Dark form: BUCHANGA LEUCOPYGIALIS, Blyth.

Adult male (Wellewatta, Colombo). Wing 4·75 inches; tail 4·0; bill to gape 1·0.

Iris dull red.

Head and entire upper surface black, illumined with steel-blue; wings and tail brownish black, with a metallic lustre, slightly greener than that of the back on the outer webs of the feathers; ear-coverts and face black, without the metallic lustre of the head; chin, fore neck, and chest dull black, intensifying somewhat on the chest, and slightly glossed in that part; on the breast the centres of the feathers become gradually brown, with the edges iron-grey, the latter paling to greyish white lower down, and thence into white on the abdomen, giving that part, however, only a whitish appearance on account of the dark centres of the feathers; vent and under tail-coverts white.

Adult male (Mapalagama, South Ceylon). Wing 4·85 inches; tail 4·9; bill to gape 1·0.

Iris obscure red.

Much darker on the lower breast and belly than the above, as it is in abraded plumage, and the *whitish edgings* are worn off from this cause; the vent is only greyish white, and the under tail-coverts sullied white; gloss on the upper surface duller, or not so green as in the freshly-moulted specimen.

Adult female (Poorie, W. Province). Wing 4·55 inches; tail 4·4; bill to gape 1·0.

Iris dark red-brown.

In more abraded plumage than the last; the entire breast and belly dull brown, the vent greyish, and the under tail-coverts greyish white.

$\frac{4}{5}$

BUCHANGA LEUCOPYGIALIS.

Adult female (Heneratgoda). Wing 4·7 inches; tail 4·7; bill to gape 1·0.
Iris dull red.
In abraded plumage, but not so dark as the above, owing to some of the feathers not being so much worn as others; the breast is greyish brown; the vent whitish, and the under tail-coverts slightly less albescent than the vent, being so much worn as to show the brownish bases of the feathers.

Female (Colombo). Wing 4·5 inches; tail 4·4.
Iris light reddish. An abnormally pale-breasted example.
Throat and chest brownish black, the sides of the latter glossed with green, the centre of the breast brownish grey, the edges of the feathers whitish, the feathers at the sides of this part still paler, and the sides of the belly whitish; vent and under tail-coverts pure white.

Intermediate form.

Male (Chilaw, 50 miles north of Colombo). Wing 4·8 inches; tail 4·9; bill to gape 1·05.
Back with a somewhat *greener* gloss than in the Colombo specimens; chest and throat black, much glossed with metallic green; the centre of the breast brown, the feathers edged paler, the flanks very dark, and the belly suddenly turning white; vent and under tail-coverts pure white.

Male (Deduru-Oya, N.W. Province). Wing 4·98 inches; tail 4·7; bill to gape 1·05.
Upper surface with a still greener gloss than the above, the entire belly and the under tail-coverts white, this colour extending up the breast in the form of a point, and becoming at the uppermost part sullied, that is to say, *whitish.*

Two adults (British-Museum specimens *b*, *c*, "Uva district;" but probably from the *west* of Nuwara Elliya). Wings 4·65 and 4·55 respectively. Resembling the above in plumage both as regards upper surface and lower parts; the whitish hue of the lower part of the breast passing into dark slate on the upper part of it.
Two adults (Kandy district). Wing 4·9 inches. Upper breast very dark; abdomen turning abruptly to white.

Light form: Buchanga insularis, Sharpe.

Adult female (Trincomalie). Wing 4·6 inches; tail 4·4; bill to gape 1·0.
Upper surface with a marked *greenish* gloss; throat blackish brown; chest black, glossed with green; upper breast dark slate, rather abruptly changing into white on the lower part of the breast and rest of under surface.

Adult male (British-Museum specimen *a*, "Ceylon," from Badulla district).
Similar to Trincomalie specimen, except that the white colour takes a pointed form on the breast.

Male, not quite adult (Badulla). Wing 4·75 inches; tail 4·9; bill to gape 1·03.
Paler on the chest and tail than any of the foregoing specimens. The upper tail-coverts are tipped with whitish.

Young (dark form on leaving the nest). Blackish brown above, without the black-green gloss of the adult. Chest and throat blackish brown, the breast slaty, the feathers of these parts finely tipped with greyish fulvous; the belly and under tail-coverts sullied whitish, the latter tipped with dusky grey.
A young bird about two months old (Ambepussa, June 29, 1875), shot with the hen bird, which was feeding it, is already acquiring the mature plumage; the black-green feathers on the upper surface predominating over the brown "nestling" ones; the chest nearly all moulted to black feathers, and the centre of the breast whitish as high up as birds from the N.W. Provinces. Wing 4·5 inches. The old bird shot with it was of the true *leucopygialis* type, the breast *much darker* than that of the young bird.
A young bird in a similar stage of change (shot at Deltota, May 29, 1876) is much darker on the breast than the Ambepussa specimen. Wing 4·8 inches.

Young (pale form: Galoya, Trincomalie Road). Similar to the Ambepussa example on the upper surface, being in a state of change from the brown nest-feathers to the glossy black-green; the under surface is paler, inasmuch as the whitish immature plumage extends higher up the breast, and instead of running up towards the chest in a point is distributed right across to the flanks.

Obs. No bird in Ceylon is so puzzling as the present, and there is none to which I have given so much attention with a view to arriving at a satisfactory determination as to whether there are two species in the island or only one. I cannot come to any other conclusion than that there is but one, the opposite types of which are certainly

somewhat distinct from one another, but which grade into each other in such a manner as to forbid their being rightly considered as distinct species; and I will leave it to others who like to take the matter up for investigation to prove whether my conclusions are erroneous or not. I see no reason why, in writing of birds from the north of Ceylon, future collectors should not style them *B. insularis*, inasmuch as these birds form a race of themselves. A perusal of the above-mentioned localities will show that the pale birds inhabit the dry portions of the island, grading into the dark race on a line drawn from Chilaw across the southern part of the N.W. Province, and thence over to the Badulla country and down into the Park districts. Mr. Boate's specimens in the British Museum came from "between Kandy and Nuwara Elliya," which I take to be the Rambodde or Pusselawa districts; they are neither strictly *leucopygialis* nor *insularis*, but resemble Deltota and N.W.-Province birds, which are intermediate, whereas examples from the dry district of Uva are the same as those from Trincomalie. The dark form from the South-west and Western Provinces is extremely variable as regards the pale lower parts, the dusky hue of which depends, as I have shown, on abrasion of plumage; and in some instances, as exemplified in the Ambepussa bird, the offspring are paler than the parents. As the plumage becomes abraded, it darkens, and the whole appearance of the pale belly is changed. Moreover it seems probable that the light form in the north sometimes becomes dark; for I have a specimen shot by Mr. Cotterill, C.E., at Hurullé tank, which is in highly abraded plumage it is true, but which has the lower breast and belly so very dusky that it could scarcely, when in new feather, have been a very light-coloured bird.

Mr. Sharpe rightly discriminated the pale Ceylonese form of the present species from *B. cærulescens*, the Indian bird. The latter has a greyer hue on the green gloss of the upper surface, the tail is a rather pale brown, instead of a dark blackish brown, and the throat and chest are dull ashy blackish, *without any green gloss on the latter*. These distinctions are especially noticeable in northern birds, from Nepal, Kattiawar, and Behar; but from further south I have examples which are darker on the chest, but of course not black, glossed with green, as in Ceylonese. South-Indian birds may perhaps be very close to ours; but I regret to say I have not seen any from that region. It is not improbable that an almost unbroken sequence from the Himalayan to the Ceylonese type could be got together, proving that there is but one species of this Drongo, divisible into local races, the darkest of which would be *B. leucopygialis* of Blyth from South Ceylon.

Examples of *B. cærulescens* which I have measured vary from 4·9 to 5·1 inches in the wing.

Layard's specimens from Pt. Pedro evidently belonged to the usual pale-bellied bird found in the north of Ceylon, which were not discriminated by Blyth, at the time they were sent to him, as distinct from the Indian birds.

Distribution.—The dark race of this Drongo inhabits the South-western District, the Western Province, and the adjacent slopes of the Kandyan hills, perhaps as far eastward as the valleys in Pusselawa and Kotmalie; while, turning to the south again, we find it spreading into the country lying between Badulla and Hambantota, and inhabiting the dividing valley which is continuous with the Saffragam division. It is generally diffused through the Western Province, being numerous in the Korales surrounding Colombo and along the sea-board generally. In large forest-tracts like those on the Pasdun and Kukkul Korales it is scarce, but even there it will be found in the open country formed by isolated tracts of cultivation. A short distance inland from Colombo it is a very common bird, and is one of the most familiar species to those who enjoy the usual evening drive round the outskirts of the "cinnamon-gardens." It is equally well known in the Galle and Matara districts.

In the Seven Korales, where the country is open in many places, it is tolerably numerous, becoming scarcer (*in the light form*) in the forests as we proceed north. In this part of the island it is not nearly so plentiful as its dark relative is in the south; but the heavy nature of the jungle probably tends much to its concealment; and the spots in which I have chiefly observed it were the outskirts of forest, clumps of jungle in grassy wastes, or the borders of village tanks. Layard seems only to have obtained it at Pt. Pedro, and regarded it as a visitor, an opinion which its scarceness on the peninsula naturally occasioned. It extends down the eastern side of the island to the country between Batticaloa and the Uva ranges, in which it is also found to an elevation of about 4500 feet. On the eastern side of the Badulla valley I frequently observed it on the estates between the capital of Uva and Lunugalla; but I did not see it on the Fort-MacDonald patnas, although I believe it is found in that tract of country.

Habits.—The "King-Crow," one of the best-known Ceylonese birds to European residents in the island, frequents native compounds, openly wooded land, the borders of paddy-fields and tanks, the outskirts of jungle, or the vicinity of grassy forest-glades; and in the coffee-districts it may usually be seen seated on stumps or

perched on the branches of dead trees left standing among the luxuriant sweeps of Ceylon's staple plant. To the admirer of bird life it must always be an interesting species, as its lively manners, familiar habits, and bold onslaughts on its winged prey make it an unfailing subject of observation. Its diet is entirely insectivorous, consisting chiefly of beetles, bugs (*Hemiptera*), termites, and such like, which it catches on the wing, returning again to its perch, on which I have observed it striking its prey before swallowing it. It is occasionally, when there is an abundance of food about, a sociable species, as many as three or four collecting on one tree and carrying on a vigorous warfare on the surrounding insect-world. It is abroad at daybreak, and retires very late at night to roost, appearing to be busy throughout the whole day, and never to be tired of uttering its cheerful whistle. One or more may often be seen chasing an unoffending Crow to a great height in the air; and though their attacks must be comparatively feeble, I have observed that they have the capability of considerably disconcerting their powerful enemy; it is from this singular habit that these and other Drongos have acquired the name of King-Crow. The ordinary note of the dark race is a whistling cry, accompanied by a quick jerk of the tail, a movement which the bird is constantly performing; but in the breeding-season the male has a weak twittering song, somewhat resembling that of the Common Swallow. I have listened to this in the north-country birds; but the ordinary note of the latter always seemed to me to be less powerful than that of the Western-Province form. This species and the Long-tailed Drongo have an inveterate hatred of Owls, and never fail to collect all the small birds in the vicinity when they discover one of these nocturnal offenders, chasing it through the woods until it escapes into some thicket which baffles the pursuit of its persecutors.

Nidification.—The breeding-season of this Drongo is from March until May; and the nest is almost invariably built at the horizontal fork of the branch of a large tree, at a considerable height from the ground, sometimes as much as 40 feet. It is a shallow cup, measuring about $2\frac{1}{4}$ inches in diameter by 1 in depth, and is compactly put together, well finished round the top, but sometimes rather loose on the exterior, which is composed of fine grass-stalks and bark-fibres, the lining being of fine grass or tendrils of creepers. The number of eggs varies from two to four, three being the most common. They vary much in shape, and also in the depth of their ground tint; some are regular ovals, others are stumpy at the small end, while now and then very spherical eggs are laid. They are either reddish white, "fleshy," or pure white, in some cases marked with small and large blotches of faded red, confluent at the obtuse end, and openly dispersed over the rest of the surface, overlying blots of faint lilac-grey; others have a conspicuous zone round the large end, with a few scanty blotches of light red and bluish grey on the remainder; in others, again, the markings are confined to a few very large roundish blotches of the above colours at one end, or, again, several still larger clouds of brick-red at the obtuse end, with a few blotches of the same at the other. Dimensions from 1·0 to 0·86 inch in length, by 0·72 to 0·68 in breadth. I once observed a pair in the north of Ceylon very cleverly forming their nest on a horizontal fork by first constructing the side furthest from the angle, thus forming an arch, which was then joined to the fork by the formation of the bottom of the structure.

The parent birds in this species display great courage, vigorously swooping down on any intruder who may threaten to molest their young.

The figure of the southern bird in the Plate (fig. 1) accompanying this article is that of a female from Heneratgoda, that of the northern bird (fig. 2) is of a female shot near Trincomalie.

Genus DISSEMURUS.

Bill stout, the culmen more acutely keeled than in *Buchanga*, as also higher at the base; forehead furnished with a tuft of frontal plumes, the anterior ones projecting forwards, and the posterior more or less curved back over the forehead. Wings with the 4th and 5th quills the longest, and the 3rd shorter than the 6th. Tail with the outer feathers prolonged more or less, in some species with the web complete and slightly upturned, in others with the shaft denuded of the webs to within a short distance of the tip.

Of large size. Plumage highly glossed above and below; the feathers of the hind neck "hackled."

DISSEMURUS LOPHORHINUS.

(THE CEYLONESE CRESTED DRONGO.)

(Peculiar to Ceylon.)

Dicrurus lophorhinus, Vieill. N. Dict. d'Hist. Nat. ix. p. 587 (1817); Gray, Hand-l. B. i. p. 285 (1869).

Dicrurus edoliiformis, Blyth, J. A. S. B. 1847, xvi. p. 297 (1847); id. Cat. B. Mus. A. S. B. p. 202 (1849); Kelaart, Prodromus, Cat. p. 124 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 129; Blyth, Ibis, 1867, p. 305; Legge, Ibis, 1874, p. 17.

Dicrurus lophorhinus, Gray, Hand-l. B. i. p. 285.

Dissemurus lophorhinus, Holdsworth, P. Z. S. 1872, p. 439.

Dissemuroides edoliiformis, Sharpe, Cat. Birds, iii. p. 256 (1877); Tweeddale, Ibis, 1878, p. 78.

Le Drongup, Levaill. Ois. d'Afr. pl. 173.

Jungle King-Crow, in Ceylon.

Kowda, Sinhalese; *Kaputa-baya*, Sinhalese in Southern Province.

Niger, chalybeo-viridi nitens, caudâ valdè forficatâ, rectricibus nigris chalybeo-viridi marginatis, rectrice extimâ longiore et ad apicem paullo recurvatâ: cristâ frontali densâ, setis nasalibus longis anticè directis et plumis cristæ posticis paullo recurvatis: subtùs niger, chalybeo nitens, plumis præpectoralibus chalybeis vix lanceolatis: rostro et pedibus nigris: iride brunnescenti-rubrâ.

Adult male. Length 13·4 to 14·1 inches; wing 5·6 to 6·0; tail—outer feathers 7·2 to 7·6, central feathers 2·3 to 2·5 shorter; tarsus 1·0 to 1·1; mid toe 0·75, claw (straight) 0·3; hind toe 0·5, claw (straight) 0·4; bill to gape 1·35 to 1·4; limit of the length of frontal feathers about 0·5.

Adult female. Somewhat smaller than the male. Length 13·25 inches; wing 5·0 to 5·6; tail 7·0.

In this species the tail assumes a constant character, and does not vary at all. It is shaped as in the genus *Buchanga*; the web is the same width throughout, broad and flat, the outer portion *only slightly* upraised, but not sufficiently to be called curved.

The anterior frontal plumes are directed forward, and the posterior ones are erect, but have no tendency to curve back over the forehead as in *D. paradiseus*.

Iris dull brownish red or dark yellowish red; bill, legs, and feet black.

Plumage black, highly glossed with a metallic lustre, which on the head, hind neck, throat, and chest is of a steel-blue tinge, and on the back, wing-coverts, and outer webs of the tail-feathers dark green; quills black, the outer webs glossed; bases of the feathers at the sides of the rump greyish, generally showing on the surface of the plumage; flanks and abdomen brownish black, scarcely glossed; the under tail-coverts glossed at the tips; the frontal plumes in fine specimens reach to within 0·4 of the tip of the culmen; the feathers of the hind neck are pointed and to some extent elongated.

1/2

DISSEMURUS PARADISEUS.
(Abnormal Form)

3/4

DISSEMURUS LOPHORHINUS.

Young. Iris brown, gradually becoming reddish with age. The nestling is black, with but little of the metallic sheen; the outer tail-feathers not much elongated. Immature birds have the under tail- and under wing-coverts tipped white; the flanks pervaded with grey, and in some examples the lower parts faintly edged with white; the under wing-coverts retain their white markings after they have disappeared from the under tail-coverts, few specimens being found without a few white terminal spots on the under wing. In this feature the genus *Dissemurus* is an exact contrast to *Buchanga.*

Obs. I have placed this species in the genus *Dissemurus*, from which it was removed by Mr. Sharpe, because the crest resembles that of some of the local races of the next bird, and it does not seem advisable to establish a genus for it simply because the outer tail-feathers are different from typical *Dissemurus.* The bird for which Mr. Hume established his genus *Dissemuroides* has a "tuft of *hair-like* feathers on the forehead, springing from each side of the base of the culmen," and therefore differs materially from the present species. Concerning the specific name of *lophorhinus* used by Vieillot, I have perused carefully Levaillant's description of the Drongup in his 'Oiseaux d'Afrique,' and likewise Vieillot's of the species to which he gave the Latin name in question; and I think that the latter was really referring to the Drongup. Levaillant says that his bird "est de la taille de notre draine, vulgairement nommée hautegrive;" and Vieillot uses words of similar meaning when he writes "à la taille de la grive-draine." The plate of the Drongup is, it is true, as far as the head is concerned, a very grotesque representation of our bird; but it is perhaps as faithful as one could expect of any drawing in the 'Oiseaux d'Afrique.' I may add that Mr. Sharpe now agrees with this view of the question, although he was of opinion, at the time he wrote on this species (Cat. Birds, iii.), that Vieillot's description was that of a Madagascar bird, *D. forficatus.*

Distribution.—The stronghold of this fine Drongo consists of the Western Province and the south-west corner of the island, including the southern hill-ranges, throughout which it is plentifully diffused. Its northerly limit is the Kurunegala district, extending along the base of the Matale hills and including the southern portion of the Seven Korales. It is found in all the forests and heavy jungles of the Western Province, and is common in the Ikkadde-Barawe forest and in the outlying jungles between there and Kotte. From Ambepussa southwards through Ratnapura to the Pasdun and Kukkul Korales it is everywhere found in heavy forest, and ascends the Ambegamoa Peak and Maskeliya jungles to a considerable altitude. It is located in portions of the interior of the Kandyan Province, as Dr. Holden, formerly resident in Deltota, has procured it in Hewahette at 3000 feet elevation. It does not appear to extend eastward beyond the slopes of the southern ranges, for I did not meet with it in the forest-tract at the base of the Haputale hills, in which district the racket-tailed species is so common. It is very abundant in the forests on the south bank of the Gindurah, appearing to thrive more prosperously in these excessively humid jungles than in those further up the west coast. I have seen what I am nearly sure to be this species in the Friars-Hood forests; but I cannot speak with certainty, as the specimen I allude to may have been an immature Racket-tailed Drongo. Nowhere else in the Eastern Province have I met with any thing but this latter species, which likewise monopolizes the whole of the northern forests beyond Dambulla.

Habits.—Damp forests and even their most gloomy recesses are frequented by this fine bird. While tramping through the humid glens of the southern jungles, when not a sound is heard but the soughing of the wind in the lofty trees around him, the naturalist is suddenly startled by the sudden outburst of the lively notes with which the Crested Drongo is wont to indulge in on being disturbed in its native haunts. Its vocal powers are remarkable and are fully brought out in the breeding-season, when the males give out a pleasing warble for the edification of their consorts; this is varied by a number of loud whistlings and calls, the result of the bird's powers of mimicry, which are quite equal to those of the next species. I have heard it imitate cleverly the cry of the Serpent-Eagle and the call of the Koel, and often listened to what were evidently attempts to mock other smaller inhabitants of the woods. It usually associates in pairs, and perches across the upper branches of lofty trees, whence it makes many a sudden dive upon passing beetles and the many larger members of the insect kingdom which affect the Ceylon forests. Its flight is powerful and swift, and it is capable of darting through thick foliage with great ease: on seizing an insect in the air it returns with it, or carries it to another perch and beats it against the branches before devouring it. I have on several occasions in Saffragam found three or four pairs of these birds in scattered company, and once in

the Opaté hills came on a flock which seemed to be moving from one part of the forest to another; they were making their way along from tree to tree beneath a vast precipice, and uttering a loud whistle, which one bird took up from the other as they disappeared from my gaze through the dense foliage. It has an inveterate dislike of Owls, particularly the "Devil-bird," which is a fellow inhabitant of the gloomy wilds; and whenever it espies one of these birds which has neglected to seek a proper place of concealment, it attacks it with loud cries, and is soon joined by a host of small birds (Bulbuls, &c.), which soon drive the luckless Ulāma to a distant part of the forest.

Nidification.—This species breeds in the south of Ceylon in the beginning of April. I have seen the young just able to fly in the Opaté forests at the end of this month, but I have not succeeded in getting any information concerning its nest or eggs.

The figure in the Plate accompanying this article is that of a very large male example shot in the Kottowe forest, having an exceptionally fine tail.

DISSEMURUS PARADISEUS.

(THE RACKET-TAILED DRONGO.)

Cuculus paradiseus, Linn. Syst. Nat. i. p. 172 (1766).
Edolius malabaricus, Layard & Kelaart, Prodromus, Cat. Ceylon B. App. p. 58 (1853); Jerdon (in pt.), B. of Ind. i. p. 437 (1862).
Edolius paradiseus, Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 128.
Dissemurus malabaricus, Holdsw. P. Z. S. 1872, p. 439; Legge, Ibis, 1875, p. 288.
Dissemurus ceylonensis, Sharpe, Cat. B. iii. p. 264 (1877); Tweeddale, Ibis, 1878, p. 82.
Dissemurus paradiseus, Hume, Str. Feath. 1878, p. 222.
Le Coucou vert hupé de Siam, Brisson; *Paradise Cuckoo*, Lath.; *The Paradise Drongo*; *The Long-tailed King-Crow*, Europeans in Ceylon. *Bhimraj*, Hind., lit. "King of the Bees."
Maha-kawuda, Sinhalese; *Erattu valem kuruvi*, lit. "Double-tailed bird," Tamils in North of Ceylon.

Adult male. Length 17·0 to 19·0 inches, according to length of tail; wing 5·8 to 6·2; tail 11·0 to 12·5 to tip of outer feather, the penultimate, in one of the latter measurement, 6·8 shorter; racket never exceeding 2·75; tarsus 0·9 to 1·0; mid toe 0·8, its claw (straight) 0·35; bill to gape 1·45.

Female. Length 15·0 to 16·0 inches; wing 5·6 to 6·1; tail 10·0 to 11·0 to tip of outer tail-feather, which projects not more than 5·5, and in some only 4·0, beyond the penultimate.

The above measurements are taken from an extensive series shot, during a period extending over five years, in the north and south of the island; and I have never met with an example with a longer racket tail-feather than 12·5 inches, extending 6·8 beyond the adjacent or penultimate feather, nor ever obtained one in which, when the bird was fully adult and the shaft *quite bare*, the racket exceeded 2·75 inches in length. In males, the largest of the sexes, the racket-feather seldom reaches 12 inches, and in females seldom exceeds 10·5; the bare portion of the shaft varies from 3·0 to 4·75 inches in length.

Iris varying from brownish red to deep red, mature, but not aged, birds having it of the former hue; bill, legs, and feet black.

Plumage deep black, highly glossed on the head, back, rump, wing-coverts, throat, and chest with dark metallic green: on the breast and lower parts the metallic sheen is of a bluer cast than that of the upper surface; a large frontal crest, the anterior feathers of which are short, very narrow and scantily webbed, and stand erect, while the posterior plumes attain a length, in the finest and oldest specimens, of 1·0 to 1·2 inch and recurve over the forehead touching the crown; feathers of the sides and back of neck "hackled"; bases of the rump and upper tail-coverts and lower flank-feathers greyish; abdomen and under tail-coverts glossless, a few white terminal spots on the under wing-coverts.

The "racket" turns up perpendicular to the horizontal plane of the tail and curves *slightly* inwards.

Young (nestling). Iris brown; bill black; legs and feet bluish black.

Just after quitting the nest (July) the crest is only slightly developed, the posterior feathers scarcely recurved at all and very short; the plumes of the head and hind neck are short and rounded at the tips; back and tail glossed with metallic green; the lateral rectrices are usually about 3 inches longer than the adjacent pair and almost fully webbed, there being a slight indentation, or hollow so to speak, opposite the end of the penultimate; beneath blackish brown; under tail-coverts fluffy and without any terminal white spots; under wing-coverts spotted with white.

In the next stage (January following), probably acquired by moult in September, the crest is tolerably developed, the posterior feathers lengthened and recurved, but rather open-webbed, the racket-feathers are denuded for about 2 inches of most of the inner web, a border next the shaft of about 0·05 inch remaining, the racket about 3·0 in length, and the whole projecting about 4½ to 5·0 inches beyond the penultimate; the feathers of the hind neck

are more lengthened than before and pointed at the tips; under tail-coverts and under wing-coverts both with white terminal spots.

At each succeeding stage the shafts of the racket-feathers become more denuded and the crest lengthens; the spots on the lower tail-coverts finally disappear, but one or two always remain on the under wing-coverts.

Obs. The Ceylonese Racket-tailed Drongo constitutes a race in which the racket-feathers are *almost* constantly smaller than those from any of the localities in the wide range of this species. It may, I think, safely be laid down as a rule that the *maximum* length of these feathers in our adult birds is about equal to the minimum in the same from Malabar, Burmah, Tenasserim, and Siam. This, at least, is the result of an examination of all the material at my disposal in England. In adult examples in the British Museum from Travancore, Malabar, Moalmaza, and Shenogah, the length by which the racket-feathers exceed the penultimate varies from 7·0 to 9·0; and I notice that Mr. Hume gives the measurement of the entire feather of a Travancore specimen collected by Mr. Bourdillon at 18·75 inches. The racket in these birds is of different shape from the Ceylonese; it is of greater length in the first place, and again longer in proportion to the breadth of the web; as a rule, likewise, the basal part of the web slopes off to the shaft beyond the tip of the penultimate. The wings also attain a greater length than in the island forms, 6·3, 6·4, 6·6 inches being some of the measurements recorded by Mr. Hume in his exhaustive article contained in the 'Birds of Tenasserim.' In fully adult specimens from South India, the crest resembles that of our old birds; but in the different stages of immaturity I observe that it bears a different character. The crest in the young bird is less developed: an example in the British Museum with the racket well formed, and a bare shaft of 2 inches in length, has no more crest than a Ceylonese *D. lophorhinus*: in another bird from Travancore the anterior portion of the crest is *bushy* and erect; in another, still older, from Moalmaza, the whole crest projects forward in a long tuft (this is not from the making-up of the skin), the posterior portion of which stands up to a height of 0·9 inch above the culmen. In all immature birds that I have examined, the prevailing characteristic is that the anterior feathers of the crest are longer than the posterior ones.

I find, on examination of the Tenasserim examples in the British Museum, and in the collection lately sent home by Mr. Hume, that the length of the racket-feathers averages the same as in the South-Indian, exceeding the penultimate from 7·0 to 9·5 inches; the racket is likewise of the same character, recurving more* inwards than in our bird. The Siamese birds vary much in length of the racket-feather. One in the British Museum exceeds the penultimate by nearly 10 inches; another, however, in the Swinhoe collection, approaches nearest of all that I have examined to the Ceylonese form. Its measurements are:—wing 6·1 inches; outer tail-feather 12·75, exceeding the penultimate by 6·9; racket 3·0; bill to gape 1·3 (shorter than Ceylonese examples as a rule); crest precisely the same. It is on the evidence of this specimen, coming from the opposite extreme of this bird's wide range, coupled with the fact of the species being so variable, that I do not keep the Ceylonese form distinct as a subspecies under Mr. Sharpe's title *ceylonensis*. More extended observations than I have been able to make, and a greater series of examples, are both necessary in order to prove whether the extreme limit of the length of the racket-feather and the size of the racket itself as given above are correct.

In the north of the island there are sometimes to be found very singular and abnormal examples of this bird with the crest tolerably well developed and recurving over the forehead, but with the outer tail-feather intermediate between that of *D. lophorhinus* and a mere nestling *D. paradiseus*. I obtained a specimen in the depths of the forest between Kanthelai and Hurullé tanks, and another in some magnificent timber-jungle at Umeragolla, on the Dambulla and Kurunegala Road; a third exists in the Layard collection at Poole. The web is entire, recurving quite inwards at the tip, whereas that of a young nestling even, of the ordinary form, has a recess or gap, as shown in the woodcut, p. 402; furthermore, one of the specimens is quite adult, having no spots on the under tail-coverts. Having met with but these examples, I feel inclined to look upon them as an abnormal form of *D. paradiseus*. If, however, additional specimens come to hand, eventually it may prove to be a distinct species; and for it I would then propose the name of *D. intermedius*.

Distribution.—This showy bird is chiefly an inhabitant of the dry region of Ceylon, from the Vanni to Puttalam on the west side, extending through all the eastern portion of the island and flat jungle-clad country between Haputale and the south-east coast up to the slopes of the Morowak-Korale ranges. In the latter region, particularly in forest on the banks of rivers, and in most of the northern forests, it is very numerous, approaching

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* This is, of course, when the bare portion of the shaft near the racket is pressed down into a horizontal position, which always gives the racket the normal twist, provided it be not injured.

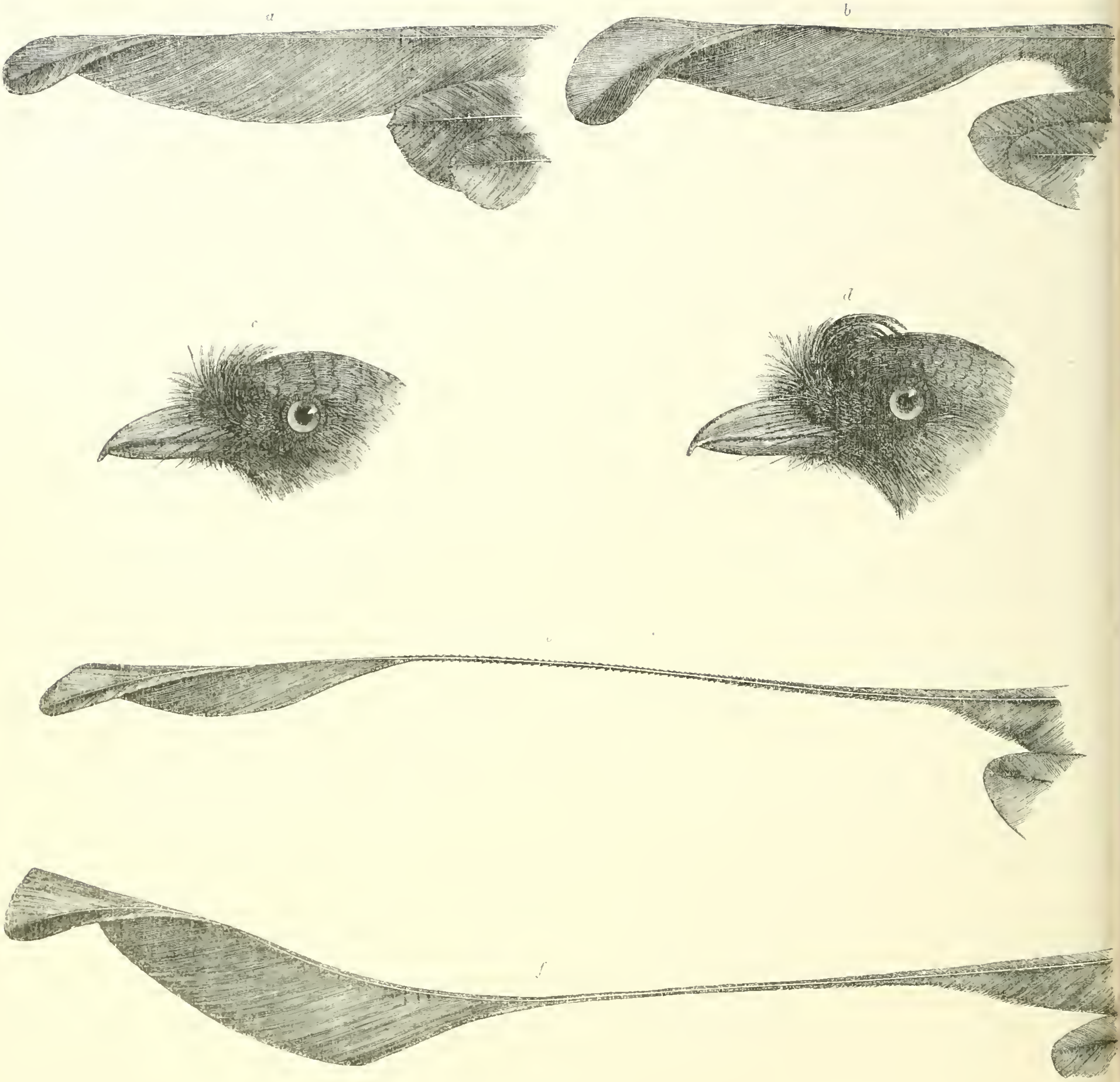
close to the sea-coast in places where the jungle is heavy. I have found it on the Lunugalla pass up to 2000 feet, and it doubtless ranges to the same elevation on the entire eastern and northern slopes of the central zone. In the Western Province I never met with it; but in 1872 I obtained an example in the forest of Kottowe, near Galle, a remarkably isolated position, some 50 miles distant from the limits of its general range. It is therefore possible that it may still be found in some of the lower forests between that point and Kurunegala, thus extending its range throughout all the low country. I have no certain evidence of its occurrence in the higher jungles of the coffee-districts; but it may possibly ascend the Haputale ranges to a considerable altitude in the dry season, and in the neighbourhood of Kandy it has been procured by Mr. Whyte's collectors. Layard procured it first at Anaradjapura, and wrote of it as being confined to the Vanni; it was also in the northern forests that Mr. Holdsworth met with it.

On the continent this fine bird ranges through India* into Burmah and Tenasserim, and spreads eastwards through Siam, whence many specimens have found their way into European collections; on going south through the peninsula of Malacca we lose it in its typical form, and find this region inhabited by the smaller race (*D. platyurus*). It has a peculiar range as far as the peninsula of India is concerned; and this is defined by Mr. Hume as the "whole of Southern India and the Western Ghâts as far north as Kandeish;" beyond this it is replaced by the large crested ally (*D. malabaroides*), again to appear in most of Burmah and Tenasserim. Jerdon says that it is found in all jungles of the west coast, from Travancore up to Goa, especially in the Wynaad and other elevated districts. In the Travancore hills themselves, Mr. Bourdillon found it common, both at the foot of the hills and up to 3000 feet elevation, and Mr. Fairbank observed it in the Palani hills. In the Deccan it is, of course, wanting; and in Chota Nagpur we find, in accordance with Mr. Hume's outline above noticed, the larger crested race, while further west no racket-tailed Drongo is found at all. In Tenasserim, Messrs. Hume and Davison say that it is common alike on hills and plains, frequenting chiefly the forests, but occurring also in gardens and scrub-jungle. With regard to Siam, I am unable to give particulars of its *local* distribution in that kingdom; but I have seen specimens from Bangkok and other localities, and I have no doubt it has been met with in whatever forest-districts Europeans have been able to collect.

Habits.—Wherever the forest is luxuriant in the north and east of the island, this splendid bird delights to reign; he is a petty monarch among the numerous feathered denizens of the woods—now exercising his varied talents in closely mocking their notes, now dashing at some diligent Woodpecker who has ventured to "fix" himself for a moment on a trunk too near the swarthy tyrant; and while he thus amuses himself, he does not miss a chance of capturing a passing beetle or locust by the exercise of a few strokes of his powerful wings. It is consequently on the banks of the romantic forest-lined rivers, or the sylvan borders of the lonely village tanks, which are both features of the wilds of Ceylon, that the Racket-tailed Drongo is met with; or it may, with equal certainty, be found on the sides of the low hills, clothed with tall timber-trees, which everywhere intersect the low-country jungles not far from the base of the mountain system. When seen flying about from limb to limb of the lofty monarchs of the forest, it gives one the impression of spending a very happy existence, displaying its long tail-feathers as it launches itself into the air and sweeps down with a graceful flight on its insect prey. When seated, it is constantly jerking up its tail, and jumping to and fro on its perch, while it calls to its companion, who is performing doubtless the like antics in some neighbouring tree. Its notes are wonderfully varied; and at one time or another I have heard it mock almost every bird in the forest. Mr. Parker writes me that its favourite note in the jungles near Uswewa is that of the Crested Eagle (*Spizaetus ceylonensis*). It has a metallic-sounding call, somewhat similar to that of the last species, which it utters in the early morning, usually from the top of a tall tree; and this is so different from its general notes that it is difficult to identify it with the bird, which is not easily caught sight of at the time. With regard to its antipathy for Woodpeckers, I may remark that I have not unfrequently seen it following about both species of our Red Woodpeckers, and darting at them while they were searching for food on the trunks of the trees.

The imitative powers of this species are matter of comment with nearly every writer who has observed it in its native wilds. Mr. Bourdillon writes, "I have often been amused to hear it imitate the cry of the Harrier-

* Although I consider that ultimately the Ceylon bird will probably stand as a distinct and small-tailed *race* or *subspecies*, I will here treat of its range as appertaining to the Indian form.



a. Racket-feather of nestling *D. paradiseus.*

b. Racket-feather of *adult* abnormal form of *D. paradiseus.*

c. Head of adult abnormal form.

d. Full-crested head of adult Ceylon *D. paradiseus.*

e. Racket-feather of Ceylon *D. paradiseus*, maximum size.

f. A small racket-feather of Malabar *D. paradiseus.*

Eagle, and see it make a sudden charge down on some smaller bird, either in sheer mischief, or to secure some insect which the latter has captured. I have also heard one imitate exactly the evening note of the Ground-Thrush (*Brachyurus coronata*). During the breeding-season they are very bold, and a pair think nothing of attacking and driving off from the neighbourhood of their nest the Harrier- or Black Kite-Eagle. I once had an adult bird brought to me which had been captured with limed twigs. Within a few hours of capture it would take cockroaches and other insect food from the hand, and soon got very tame." Mr. Davison, who remarks that its powers of imitation are perfectly marvellous, writes, "I have heard it take off *Garrulax belangeri* so that I am sure the birds themselves would not have detected the imposture. These Babbling Thrushes, by the way, always associate with other kindred species in large flocks, and hunt, straight on end, through the forest; and you will invariably find two or more of the Drongos following or accompanying each such flock."

It is noteworthy that this bird always sweeps *down* from its perch at its prey; I never saw it fly up at it, although it generally mounts again with the impetus imparted by its first onset.

Concerning the nidification of either the Ceylonese or Indian races of this species, I am, I regret to say, unable to give any information. As I have shot the young in nestling plumage in July, it is patent that the breeding-season is at the commencement of the S.W. monsoon rains. The northern form of this Drongo, *D. malabaroides*, builds, according to Jerdon, who had the nest brought to him at Darjiling, "a large structure of twigs and roots." Doubtless our bird has a similar habit, and its eggs are very probably three in number.

The accompanying woodcuts are explanatory of the various points treated of in this article, and are carefully drawn to life-size.

On the Plate accompanying the preceding article will be found a figure of the abnormal form of this species referred to above. As the subject is in the background, the full development of the crest, as it appears on the opposite page, cannot be shown in the drawing.

PASSERES.

Fam. MUSCICAPIDÆ.

Bill straight, wide, depressed; tip decurved and distinctly notched; gape furnished with bristles directed forwards. Wings more or less pointed, the 1st quill fairly developed. Tail variable. Legs and feet small and feeble. Tarsus shielded with smooth broad scales.

Genus TERPSIPHONE*.

Bill large, compressed suddenly near the tip; culmen well keeled; rictal bristles very long. Nostrils protected by a few rather long bristles. Wings pointed, the 1st quill about half the length of the 2nd; the 4th and 5th longest, and the 3rd shorter than the 6th. Tail long, with the two central feathers greatly elongated in the adult males. Tarsus longer than the middle toe, which is nearly equalled by the outer.

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* The generic term *Terpsiphone*, Gloger, has precedence of *Tchitrea*, Lesson, by four years. The older term *Muscivora* is restricted by Mr. Sharpe to New-World Flycatchers—the Crested Tyrants.

TERPSIPHONE PARADISI.
(THE PARADISE FLYCATCHER.)

Muscicapa paradisi, Linn. Syst. Nat. i. p. 324 (*ex* Briss.); Sykes, P. Z. S. 1852, p. 84; Jerdon, Ill. Ind. Orn. pl. 7 (1847); Gould, B. of Asia, pt. 5 (1853).

Muscipeta castanea, Temm. Pl. Col. iii. text to pl. 584.

Tchitrea paradisi, Less. Traité, p. 386 (1831); Blyth, Cat. B. Mus. A. S. B. p. 203 (1849); Kelaart, Prodromus, Cat. p. 123 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 126; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 133 (1854); Jerdon, B. of Ind. i. p. 445 (1862); Holdsw. P. Z. S. 1872, p. 440; Hume, Nests and Eggs, i. p. 196 (1873); Ball, Str. Feath. 1874, p. 403; Hume, ibid. 1875, p. 102; Butler, *t. c.* p. 466; Ball, ibid. 1877, p. 415.

Terpsiphone paradisi, Cab. Mus. Hein. i. p. 38 (1850); Sharpe, Cat. B. iv. p. 346 (1879).

The Pyed Bird of Paradise, Edwards, Nat. Hist. Birds, iii. pl. 113; *Paradise Flycatcher*, Latham; *Bird of Paradise*, Europeans in Ceylon. *Shah bulbul*, Hind. (White Bird); *Sultana bulbul*, Hind. (Red Bird); *Taklah*, Hind., N.W. Provinces; *Tonka pigli pitta*, Tel.; *Wāl-kondalati*, Tam., lit. "Long-tailed Bulbul."

Ginni hora (Red Bird), lit. "Fire-thief," *Radde hora* (White Bird), lit. "Rag- or Cotton-thief," Sinhalese; *Wāl-kuruvi*, Ceylonese Tamils; *Ladram de fogo* (Red Bird), Portuguese in Ceylon.

Old male (with long tail). Length 17·75 to 21·0 inches, according to the length of the tail, which, on the average, varies from 13·0 to 15·0, but sometimes attains a length of 17·0; centre tail-feathers 9·0 to 13·0 longer than the adjacent pair; wing 3·7 to 3·8; tarsus 0·7; mid toe and claw 0·6; bill to gape 1·0 to 1·1.

Old male (with short tail). Central tail-feathers, *fully grown*, exceeding the rest by only 0·5 inch.

Iris dark brown; eyelid cobalt-blue; bill fine cobalt-blue; legs and feet paler blue than the bill; claws bluish brown.

Entire head and neck, with a long coronal crest of lanceolate feathers, shining blue-black, which colour terminates in an abrupt edge round the throat and hind neck; rest of the body above and beneath, with the wing-coverts and tail, white; quills and primary-coverts black, with white edges, increasing in width towards the innermost secondaries, and not reaching to the tips of the outer primaries; two innermost secondaries all white but a black shaft-streak; edges of all but the centre tail-feathers, and the shafts of all except the terminal portion of the centre pair, black. In some specimens the shafts of the dorsal and wing-covert feathers, and those of the plumes at the sides of the breast, are black.

Adult male. At an age in which the male breeds, probably in the second year, the back, wings, upper tail-coverts, and tail are cinnamon-red; the head and throat blue-black, as in the older bird; the chest, just beneath the black boundary, slate-grey, fading off into white on the lower breast and rest of the underparts; under wing-coverts white, with the bases of the feathers cinnamon.

Birds at this stage have, for the most part, long tails, the centre feathers varying from 9 to 11 inches in length beyond the remainder; but some have these feathers only slightly elongated, as in the female noticed below.

Adult female. Like the short-tailed males, with the same parts of the plumage red: wing 3·5 to 3·6 inches; central tail-feathers 4·5 to 5·0.

Young. Nestling, scarcely fledged (in National collection). Head and hind neck brownish, tinged with chestnut-reddish; back, wings, rump, and tail paler chestnut than the adult; inner webs of quills brown; fore neck and chest greyish, tinged with chestnut, passing into fulvous on the flanks; remainder of under surface whitish, blending into the above-named colours.

When fully fledged the back, wings, and tail are chestnut-red, the inner webs of the quills dusky, the head, crest, and hind neck glossy black, and the chin and throat dark iron-grey, almost black on the chin, and blending into the paler grey of the chest and breast, which changes into greyish white on the lower parts. The female has the throat paler than the male.

Change of plumage. At a certain age, and at a season of the year varying in Ceylon from November until May, the male birds change by an alteration in the colour of the feathers from chestnut-red to white. The red colour on the quills, scapulars, and rectrices changes or fades into white, and the shaft-streaks of black simultaneously appear. The scapulars and primaries usually change first, and then the tail-feathers; and of the body-feathers, I have generally noticed that the upper tail-coverts are the first to fade. While this is going on (and, in fact, from what I have been able to gather from all the specimens that I have examined, almost before any of the upper-surface feathers have changed) *the grey breast just beneath the black throat turns white.* I have a short-tailed example with a pure white chest and only one white feather (in the scapulars) on the upper surface. There are a series of long-tailed chestnut examples in the national collection with various white feathers among the primaries, secondaries, scapulars, and rectrices, and all with chests pure white.

Obs. Mr. Sharpe remarks, in his Catalogue, that South-Indian and Ceylonese red birds have the chest greyish, and those from Northern India white. I observe, however, that these white-chested examples are all in a state of change on the upper surface to the white plumage; and at this period the chest is always white in Ceylon birds, inasmuch as it seems to be the first part to change.

The nearest ally to this species is *T. affinis*, which inhabits Burmah, Malacca, and portions of the Malayan archipelago. It is distinguished from *T. paradisi* by having the feathers of the crest all of the same length, giving it a broad and "bushy" appearance, and also by the white bird having the feathers of the hind neck and back with black shafts, and the adjacent edges of the web grey, which imparts a streaky appearance to the upper surface. Red birds which I have examined in the national collection have nearly all the under surface dark iron-grey, the abdomen and under tail-coverts only being white. Young birds have the back *yellowish* chestnut, changing into a darker hue on the rump, and the under surface yellowish or fulvous grey. The measurements of a red bird from Burmah are—wing 3·5 inches, tail 13·5; a white example (Sumatra)—wing 3·5, tail 10·5; another (Flores)—wing 3·55, tail 13·4.

Distribution.—The Paradise Flycatcher is a partial migrant to Ceylon, and its movements are perhaps the most singular and the most difficult to study of any Ceylonese bird. The adults, in red and white plumage, arrive in the island about the last week in October, spreading over the whole country, and not finally leaving again until the latter end of May. In the damp districts on the western side lying between Negombo and Tangalla it remains no longer than March. An inland movement then takes place north and east, many birds, however, at the same time (according to my observations) quitting the island entirely. Others remain in the last-named quarters to breed, and do not leave until the end of May, or even the first week in June. By this time the whole of the white birds have disappeared, and I believe also the adult red ones. I have never seen a long-tailed red bird between the months of May and October, nor can I find any one who is certain of the contrary. Should I be correct, therefore, in this hypothesis, the fact of a total migration of the adults is established. The young birds remain in the island, inhabiting the northern half and the eastern side as far as Hambantota; and on the arrival of the adults in the following season many of these yearlings follow them into the west. It appears, however, probable that with the general inflow in October many yearling birds arrive from abroad, as the numbers to be met with in all parts of the low country preclude the possibility of their all being recruited from inland-bred birds. Here, then, we have the extraordinary fact of the disappearance of all old birds in the island, whereas their progeny are left behind to await their return in the following season, and likewise the arrival, with these latter, of many more young from the mainland, who partake in the general stream of migration throughout the country. As regards the mountainous districts of the island, Dumbara and other parts of corresponding altitude in the Kandyan Province, and also portions of the southern ranges, are visited for the same period as the west coast, the birds quitting the hills in March. I am not aware of its occurrence anywhere above an altitude of 2000 feet, at which Mr. Bligh has seen it in the Kandy district. It inhabits the northern and eastern portions of the island in greater numbers than the west coast, there appearing to be an appreciable diminution of the species south of the Maha-Oya, north of which,

in the Kurunegala district, it is extremely abundant. As regards the young birds during the south-west monsoon, I have found them more abundant in the low-lying forests between Haputale and the sea than anywhere else.

I would add here that in my conclusions concerning the migration of the old birds I am supported by my friend and correspondent, Mr. Parker, who has paid particular attention to the subject during his residence at Madewatchiya, where the species was very numerous and bred in April and May. Mr. Holdsworth observed many immature birds at Aripu during the south-west monsoon; but I am not aware that he met with any adult red birds. As regards the earlier migration of the adults, and the arrival with them of many young birds, it can be explained on the assumption that most birds leave the island to breed on the mainland, bringing their young back with them, while a few that have paired as early as April are constrained to remain behind for a period and breed in the island, departing soon afterwards *without their young.*

On the continent the Paradise Flycatcher is found from the extreme south of the peninsula to the Himalayas. To the westward it extends to the province of Guzerat and the vicinity of Kattiawar; it is, says Capt. Butler, not uncommon at Mount Aboo, and it likewise occurs at Sambhur and Ajmere. Mr. Brooks has observed it in the valley of the Bhagirati, even above Mussoori, but it does not seem to ascend the Himalayas to any considerable altitude. In Travancore, Mr. Bourdillon writes that it ascends the hills in March and April when the weather is hot; but in the Palanis Mr. Fairbank only observed it at the base of the ranges. Messrs. Davidson and Wender say that it is "freely scattered all over the Deccan," and they believe that it breeds at Satara. Mr. Ball writes that it is a remarkable fact that it does not visit the Chota-Nagpur and Sambalpur jungles until March and April. In 1875 he observed no birds until the latter month, and saw them after that daily during the month of May, "while marching through the Orissa tributary mehals."

It is worthy of remark that this bird has been called the Paradise-bird from the earliest times. Edwards, who figured it as the "Black-and-white crested Bird of Paradise," says that it had been described formerly by Mr. Petever in Ray's 'Synopsis Methodica Avium,' published in the 17th century, and he likewise speaks of having seen three skins of it in London.

Habits.—This remarkable bird is very fond of the neighbourhood of water, and is always found in shady trees surrounding tanks, swamps, and wet paddy-fields, or bordering rivers and streams in the forests. The fine bamboos on the western and southern rivers are a favourite resort. It is, however, not confined to aqueous spots, but is found in jungle of all descriptions and in the densest forests. It is a very tame bird, exhibiting not the slightest fear of man, and often takes up its abode in jack, bread-fruit, and other cultivated trees adjacent to native cottages, about which it darts, whisking its long tail to and fro, and when in the white plumage forms a conspicuous and beautiful object as contrasted to the surrounding dark-green foliage. It is very lively in the evenings before roosting, uttering its harsh note, *tchrēet,* and darting actively on passing insects. It is capable of much longer flights than most Flycatchers, frequently compassing the distance across some wide paddy-field with ease and celerity. Its peculiar appearance when thus flying, with its long tail extended like a piece of rag or cotton, has acquired for it the curious native appellations by which it is known. It does not return to its perch after taking its prey, but darts off to another, and so moves about more than is usual with other Flycatchers. I have once or twice disturbed it from the ground, which proves that its habits are to a slight extent terrestrial—a remarkable feature in a Flycatcher. Mr. Ball has seen it alight on the ground, and writes that Captain Gray and Mr. Levin confirm his statement that it does do so; the former mentions three of the chestnut birds hopping round his chair, and the latter saw young birds settling on the ground in his garden and hopping about after insects.

Nidification.—Mr. Parker writes me that the Paradise Flycatcher breeds about Madewatchiya in April and May. Layard mentions having found a nest at Tangalla, in the fork of a satin-wood tree, and that the nest was "a neat well-built cup-shaped structure, composed externally of mosses and lichens, and lined with hair and wool."

Mr. Hume writes that "the nest is commonly a delicate little cup, never very deep, often rather shallow, composed, according to locality, of moss, moss-roots, vegetable fibres, and fine grass, which latter generally constitutes the greater portion of the framework, bound round exteriorly with cobwebs, in which little silky-

white cocoons are often intermixed! The exterior depth is about 2 inches, and the cavity varies in diameter from 2·0 to 2·75, and in depth from 1·0 to 1·6. There is not uncommonly a good deal of horsehair woven in the exterior surface of the cavity, and this, with the fine grass, forms a sort of lining." The structure is usually placed on a horizontal branch, often where three or four twigs spring from it, which, Captain Hutton remarks, are incorporated into its sides, the materials entirely enveloping them. It is sometimes fixed to the branch by means of grass and spiders' webs. In Cashmere Dr. Henderson found the nests of these birds in apple- and mulberry-trees, placed high up in small branches, and made of fine hair-like strips of bark. The number of eggs usually laid is four; the ground-colour is pinkish white or salmon-pink, more or less thickly speckled, chiefly at the large end, with rather bright brownish-red spots. They average in size 0·81 by 0·6 inch.

Genus HYPOTHYMIS.

Bill very broad and not compressed until near the tip; upper mandible flattened, and the lower inflated beneath; rictal bristles long and directed forward. Wings with the 5th quill the longest, the 2nd shorter than the secondaries, and the 3rd and 7th subequal. Tail equal to the wing, even at the tip. Legs and feet slender; the tarsus much longer than the middle toe, protected with well-developed scutæ; outer toe longer than the inner; claws well curved.

HYPOTHYMIS CEYLONENSIS.

(THE CEYLONESE AZURE FLYCATCHER.)

(Peculiar to Ceylon.)

Myiagra cærulea (Vieill.), Layard & Kelaart, Prodromus, App. p. 58 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 126.

Myiagra azurea (Bodd.), Jerdon, B. of Ind. i. p. 450 (1862), in pt.; Legge, J. A. S. (Ceylon B.) 1870–71, p. 36; Holdsworth, P. Z. S. 1872, p. 440; Legge, Ibis, 1874, p. 18, et 1875, p. 275.

Hypothymis ceylonensis, Sharpe, Cat. B. iv. p. 277 (1879).

The Blue Flycatcher, Europeans in Ceylon.

Marawa, Sinhalese (applied to small Flycatchers).

Similis *H. azureæ*, sed maculâ nuchali nigrâ parvissimâ et fasciâ nigrâ jugulari nullâ distinguenda.

Adult male and female. Length 6·0 to 6·2 inches; wing 2·6 to 2·8; tail 2·75; tarsus 0·6; mid toe and claw 0·5; bill to gape 0·6 to 0·7.

Male. Iris dark brown; bill dull cobalt-blue; legs and feet dusky blue or bluish plumbeous.

Head, neck, back, wing-coverts, throat, and chest azure-blue, the head and throat of a brighter though paler hue than the rest; a spot above the nostril and a small patch on the nape velvety black; wings brown, edged with the hue of the back; tail the same, the lateral feathers tipped pale; breast, abdomen, and under tail-coverts white; thighs bluish; under wing-coverts bluish, edged and tipped with white.

Female. Bill duller blue than male; legs and feet paler.

Head, hind neck, and throat cærulean blue, less brilliant than the male, and shading on the chest and back into brownish ashy, the feathers margined there with dull blue; wings and tail brown, edged with bluish; lower underparts as in male. The black nuchal patch wanting.

Young. In first plumage the iris is brown; bill blackish, the tip of the under mandible lightish; tarsi bluish, feet dusky. The male has the head and throat dull blue; chest bluish grey; back and wings glossy brown, the tertials with a fulvous tinge; tail dark brown, obscurely washed with bluish; thighs dark grey. Nuchal patch and throat-stripe wanting.

Obs. Mr. Sharpe has separated the Ceylon Azure Flycatcher from its Indian relative (*H. azurea*) on account of the absence of the black throat-bar and its much smaller nape-patch. The specimens he had to assist him in this determination were mine, and, so far as my small series proves, the insular bird certainly differs from the continental. I have minutely examined the chest-feathers of several males, and can find no trace whatever of any black tippings, although, singularly enough, their undersides are *blackish brown*, and, further, the tips of the feathers, where the black bar should be, form a regular, slightly upturned, transverse line, and contrast in their brighter blue with the slightly duller tint of the underlying ones, so that at first sight it would seem as if a fine dark line really did exist.

Specimens of *H. azurea* which I have examined from various parts of India, China, Formosa, Sumatra, Borneo, &c., all exhibit a more or less well-developed jugular streak; in some it is nearly $\frac{1}{8}$ inch wide. A Formosan specimen measures in the wing 2·8, an "Indian" 2·75, one from Nepal 2·9, and one from Bintulu 2·75. *H. occipitalis* is a closely allied species from the Philippines, Flores, and other islands, differing in having the abdomen and under tail-coverts washed with bluish instead of being pure white, as in *H. azurea* and *H. ceylonensis.* The throat-bar is present in all examples I have examined.

Distribution.—This pretty blue Flycatcher is generally dispersed throughout the jungles and forests of the interior, not ranging much above the lower hill-districts, except, perhaps, in Uva and in the ranges to the

north-east of Kandy, where I have seen it between 2000 and 3000 feet. It is common enough in its sylvan haunts; but I doubt if it is a familiar bird to any but those who frequent the jungle. In the low thorny scrubs bounding the sea-board on the dry portions of the island it is not found, nor did I observe it anywhere in the Jaffna peninsula. In the Western Province it may be seen close to the shore, frequenting the woods at the back of the cocoanut-plantations which border the sea, while further inland, as well as in the south-west hill-region, it is tolerably numerous.

Habits.—This species is found, either singly or in pairs, affecting forest, shady jungle, and bamboo-thickets, and is also met with in small groves or detached woods in cultivated districts. It usually keeps to underwood, or dwells in the lower branches of forest trees, generally selecting those spots which are enlivened with a gleam of sunshine, where it may be seen actively darting on small flies and insects, while it utters its sharp little note, resembling the word *tchrēēt*. After the breeding-season young birds associate in small troops; and at such times I have noticed them following each other about among the upper branches of tall trees.

Nidification.—In the Western Province this Flycatcher breeds from April to July, or during the south-west monsoon rains, building a beautiful little nest in the fork of a sapling or shrub at about 4 feet from the ground; it is constructed of moss and fine strips of bark, very neatly finished off at the edge, decorated with cobwebs on the exterior, and lined with very fine creeper-tendrils, the interior forming a deep cup of about $1\frac{3}{4}$ inch in diameter. The eggs are either two or three, round in form, of a buff-white ground-colour, spotted openly, chiefly at the obtuse end, with light sienna-red, mingled with darker specks of red. They measure 0·66 by 0·55 inch.

The centre figure in the Plate accompanying my article on *Alseonax muttui* (p. 417) represents a male bird of the present species from Ackmimina, near Galle.

Genus CULICICAPA.

Bill more compressed towards the tip and the culmen more raised than in the last; rictal bristles very long. Wings long, the 4th quill the longest, and the 2nd equal to the 8th. Tail even. Legs and feet very small. Tarsus feathered at the top.

CULICICAPA CEYLONENSIS.

(THE GREY-HEADED FLYCATCHER.)

Platyrhynchus ceylonensis, Swains. Zool. Illust. ser. 1, pl. 13 (1820–21).

Cryptolopha cinereocapilla, Blyth, Cat. B. Mus. A. S. B. p. 205 (1849); Kelaart, Prodromus, Cat. p. 122 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 127; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 147 (1854); Jerd. B. of Ind. i. p. 455 (1862).

Culicicapa cinereocapilla, Swinhoe, P. Z. S. 1871, p. 381.

Myialestes cinereocapilla, Holdsw. P. Z. S. 1872, p. 441; Hume, Nests and Eggs, i. p. 205 (1873); Legge, Ibis, 1874, p. 18.

Culicicapa ceylonensis, Fairbank, Str. Feath. 1877, p. 401; Hume, B. of Tenass., Str. Feath. 1878, p. 226; Sharpe, Cat. Birds, iv. p. 369 (1879).

The Ceylonese Flatbill, Swainson; *Zird phutki*, Beng.

Adult male and female. Length 4·9 to 5·2 inches; wing 2·4 to 2·6; tail 1·9 to 2·2; tarsus 0·55 to 0·6; mid toe and claw 0·45 to 0·5; bill to gape 0·55.

Iris brown; bill, upper mandible blackish, lower fleshy at base, with the tip dark; legs and feet brownish yellow, yellowish brown, or greyish yellow; soles yellow, claws pale brownish.

Lores, head, hind neck, and cheeks cinereous grey, the centres of the feathers on the head blackish slate-colour; on the hind neck the grey blends into the greenish yellow of the back, scapulars, wing-coverts, and rump, the latter being more yellow than the back; wings and tail dark brown, edged with the hue of the rump, except on the two outer primaries and the lateral rectrices; orbital fringe greyish; throat, chest, and sides of neck pale ashy grey, blending into the grey of the upper parts; beneath, from the chest, saffron-yellow, shaded with greenish on the sides of the breast and flanks; under wing-coverts greenish yellow.

Young. Immature birds in their first plumage almost resemble adults; the lores are greyish, and the colouring of the breast more overcast with greenish; the wing-coverts are tipped with yellowish, and the lower parts not so yellow as in the adult.

Obs. I have compared an extensive series of this species with Ceylonese examples, with the following results:—A Cashmere, a Pegu, a West-Javan, and a N.W.-Himalayan example are all slightly yellower on the back than the majority of Ceylonese birds, and vary in the wing from 2·25 to 2·5, the latter measurement being that of the Pegu example. Another specimen, from the N.W. Himalayas, is paler than all, and has the rump yellower and the quills more conspicuously edged than in the rest of the series. A Sarawak example is an exact match with those in my collection from Ceylon. It therefore appears that this species is spread over a very large geographical area, with but little variation in the character of its plumage.

Distribution.—In Ceylon the present species is essentially a hill-bird, and is, within its own limits, the most abundant of its family in the island. It inhabits the Kandyan Province from the Horton Plains and the tops of the highest ranges down to a general elevation of about 1800 feet; in the wilderness of the Peak, however, I have met with it at an altitude of only 1000 feet, a little above the pretty elevated plain of Gilly-mally. In the southern coffee-districts it is quite as numerous as in the Central Province, and it is also found in the more elevated parts of the Kukkul Korale, as well as in the great Singha-Rajah forest. In large tracts of mountain-forest, such as those covering much of the Nuwara-Elliya plateau and its great outlying spurs and the upper portion of the Knuckles range, it is more abundant than in the lower-lying coffee-districts which have been denuded of forest.

Jerdon writes that the Grey-headed Flycatcher is dispersed throughout all India, from the Himalayas to the Nilghiris, the only locality in the south of India where it is common being the summits of the latter hills. In Central India it is occasionally met with, and is not rare in Lower Bengal. As it is so common in Ceylon

it is singular that it is not found in all the elevated forests in the south. I observe that it is not recorded from the Travancore hills, though Mr. Fairbank says it is common on the *top* of the Palanis and in "groves lower down." It does not seem to extend towards the north-west frontier beyond the Sambhur Lake, where Mr. Adam remarks that it is very rare. Turning to the east, however, it is diffused throughout the sub-Himalayan region, breeding up to 7000 feet, and stretches into Assam, Burmah, and Tenasserim, in which latter province Mr. Hume says it is found sparingly, extending the whole way down the Malayan peninsula to Singapore island. Further south than this it is found in Java and Borneo; and returning again to the continent we find Swinhoe recording it from the Szechuen Province.

In common with not a few other widely-distributed species, this little Flycatcher was first made known from Ceylon, the specimen figured by Swainson in his 'Zoological Illustrations,' and called by him the Ceylonese Flatbill, having been sent to him by that diligent naturalist Governor Loten.

Habits.—This is a charmingly tame and fearless little bird, whose merry little whistle is one of the characteristic sounds of the cool up-country forests of Ceylon. It frequents the lower branches of forest trees, the edges of clearings in the jungle, patna-woods, &c., and is particularly fond of trees at the sides of roads and on the borders of mountain-streams. It is exceedingly active, and for the most part lives in pairs, carrying on its insect-trapping vocation in perfect disregard to any thing going on around it. I have known it swoop at an insect and alight on a fallen log or low stump within a few feet of a bystander. It accompanies its occupations by the exercise of its vocal powers, frequently giving vent to its cheerful note, while it snaps up its prey with an audible sound of its mandibles. The whistle of the male is a more than usually loud note for a bird of such small size, and resembles the syllables *tit-titu-whēēe*, and in the morning is very frequently repeated. Birds of the year congregate in little troops unaccompanied by adults, and keep up a constant twittering note.

Jerdon writes of its habits as follows:—"It is tolerably active and lively, making frequent sallies after small insects, and not always returning to the same perch, but flitting about a good deal, though it usually remains in the same tree or clump of trees for some time."

Nidification.—I have not had the good fortune to obtain any information concerning the nesting of the present species in Ceylon; but on consulting Mr. Hume's admirable work on the nests and eggs of Indian birds, we find that in India the Grey-headed Flycatcher lays during the months of April, May, and June, and constructs its nest, according to Indian observers, amidst the growing moss on some perpendicular rock or old trunk of a tree; it is composed of moss, cobwebs, and lichens, sometimes lined with moss-roots or with fine grass-stalks. The nests resemble little watch-pockets of moss, the interior of which is about 1 inch in diameter by about 2 inches in depth, and, fixed as they are to the moss-grown trunks, are very difficult to discover. Capt. Hutton speaks of one which had depended beneath it "a long bunch of mosses, fastened to the tree with spiders' webs, and serving as a support or cushion on which the nest rested." The number of eggs is usually four; Mr. Hume describes them as moderately broad ovals, scarcely compressed towards the small end; they are dingy yellowish white, and they have a broad conspicuous confluent zone of spots and blotches towards the large end, the colour of which is a mottled combination of dingy yellowish brown and dingy purplish grey; the rest of the egg is more or less thickly spotted with very pale dingy brown. They are almost glossless, and average 0·62 inch in length by 0·48 inch in breadth.

Genus RHIPIDURA.

Bill compressed suddenly near the tip, culmen raised; rictal bristles very long; nasal bristles well developed. Wings with the 1st quill about half the length of the 2nd; 4th the longest. Tail exceeding the wing, and expanding towards the tip; lateral feathers graduated. Tarsus longer than the middle toe.

RHIPIDURA ALBIFRONTATA.

(THE WHITE-FRONTED FANTAIL.)

Rhipidura albofrontata, Frankl. P. Z. S. 1831, p. 116; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 145 (1854).

Leucocerca albofrontata, Jerd. Madr. Journ. 1840, xi. p. 12; id. Ill. Ind. Orn. pl. 2 (1847); Blyth, Cat. B. Mus. A. S. B. p. 206 (1849); Hume, Nests and Eggs, i. p. 201 (1873); Ball, Str. Feath. 1874, p. 404.

Leucocerca compressirostris, Blyth, J. A. S. B. 1849, xviii. p. 815; Kelaart, Prodromus, Cat. p. 123 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 126; Jerdon, B. of Ind. i. p. 483 (1862).

Leucocerca aureola, Blyth, Ibis, 1866, p. 370; Holdsw. P. Z. S. 1872, p. 440; Hume, Str. Feath. 1873, pp. 178, 436, et 1875, p. 104.

Rhipidura albifrontata, Sharpe, Cat. B. iv. p. 338 (1879).

The White-browed Fantail, Jerdon; *Fantail*, Europeans in Ceylon *Shamchiri*, Hind. in North-west; *Macharya*, lit. "Mosquito-catcher," Hind. in South; *Manati*, lit. "Washerman," Malabar.

Marawa, Sinhalese.

Adult male and female. Length 6·8 to 7·1 inches; wing 3·0 to 3·25; tail 3·2 to 3·4; tarsus 0·7 to 0·8; mid toe and claw 0·55; bill to gape 0·65 to 0·7.

Iris brown; bill black, pale at base beneath; legs and feet blackish brown or black, in some wood-brown.

Crown, nape, lores, throat, and face black, blending on the hind nape into the cinereous blackish brown of the upper surface; wings and tail brown; forehead and a very broad band over the eye to the nape, under surface from the throat down, and terminal portion of all but the centre tail-feathers pure white; the white of the lateral rectrices occupies its major portion, varying from 1·4 to 1·6 inch on the inner web, and running up the outer web to the base; wing-coverts with terminal white spots; chin and gorge edged white, which varies much in extent, occupying in some individuals the lower part of the cheeks; quills blackish brown; wing-lining black, edged or barred with white.

The hue of the upper plumage fades with time, and scarcely any two specimens appear to be exactly alike; in such abraded plumage the head is blackish brown, and the back dark cinereous brown, with the *wing-covert tips much reduced in size.* In some specimens the white supercilium meets, though imperfectly, round the nape.

Young (India). A specimen in nestling plumage has the eye-stripe narrower than the adult, the feathers, as well as the adjacent blackish ones on the occiput, slightly tipped with rufous; scapulars, back-feathers, tertials, and wing-coverts tipped with rufous; the white on the tail-feathers reduced; the throat blackish, but not so dark as in the adult, and less tipped with white; under surface white, tinged with buff.

Obs. Blyth separated the Ceylonese bird from the Indian, alleging that its bill was more compressed and that it had less white on the tail. I imagine he was led to these conclusions by an examination of immature specimens, for I

have not been able to verify their distinctness on comparing the insular specimens with Indian. Some of the latter have more white, perhaps, on the lateral tail-feathers than the generality of Ceylon birds, but others have less; and as to the bills, I find that three specimens from N.W. Himalayas, Gondul, and Dehra Doon, in the national collection, are smaller in the bill than ours; they vary from 0·55 to 0·63 from gape to tip. A North-west Province example measures in the wing 3·35 inches, and has the white of the lateral tail-feather extending up it 1·8 inch; one from Rawul Pindi measures 2·9 in the wing, and two from Dehra Doon 3·15 and 3·2 inches respectively; and these last three have the greater wing-coverts very deeply tipped with white; but this, I think, is an individual peculiarity. Mr. Nevill, of the Ceylon Civil Service, in a communication made to the 'Journal of the Asiatic Society,' Ceylon Branch, 1867–70, p. 138, writes of seeing a Fantailed Flycatcher in the Nuwara jungles, which he describes (from seeing the bird on the wing, I conclude) as having the "breast broadly banded with mingled black and white." It is possible, as Mr. Holdsworth suggests, that it may have been *R. pectoralis*, although I consider it more probable that it was the young of the present species.

An adult *R. pectoralis* (Godaveri valley) measures :—Wing 2·7 inches; tail 4·1; tarsus 0·75; bill to gape 0·61.

Head and face blackish, paling into brown on the back, and into brown tinged with rusty on the rump; supercilium white; throat white; fore neck and sides black; centre of the chest, breast, and lower parts buff, darkening into rufescent on the abdomen and under tail-coverts; sides of the chest blackish brown; wings and tail pale brown, the tail-feathers gradually paling towards the tips into dull whitish.

Distribution.—The "Fantail" is chiefly an inhabitant of the dry jungle-region between the Haputale mountains and the south-east coast, the eastern portion of the low country as far as the delta of the Mahawelliganga and the district of Uva, including the patna-basin at the foot of the main range. In the first-named tract of country, including the "Park," it is more common than elsewhere, frequenting the jungle on the borders of tanks and also detached clumps of wood. From the Bintenne country it ranges up into Dumbara and the valleys in the Hewahette and Maturata districts, where it is by no means rare. In Uva it is found chiefly on tree-dotted patnas, and in the glens intersecting the great basin between Udu Pusselawa and Haputale. It would appear that it is found occasionally on the plateau, the only evidence to this effect being that of the bird seen near Nuwara Elliya by Mr. Nevill. It is rare to the west of Tangalla, but is occasionally seen during the north-east monsoon in the Galle district, as I have met with it at that season at Baddegama. I have never seen it in the neighbourhood of Trincomalie nor to the north of that place; but there is no reason to suppose that it does not inhabit this quarter of the island.

Jerdon writes, "The White-browed Fantail is found all over India, except Lower Bengal, extending to the foot of the Himalayas, only not towards the south-east. It is most common in Malabar and the Deccan, and is not rare in the North-west Provinces and in Sindh." Concerning its north-western limit, Mr. Hume says that it is common throughout the whole region, including Sindh, Mount Aboo, and Guzerat. He remarks that it breeds as high up as 4000 feet on the Himalayas. Extending to the east, I find that Mr. Inglis does not record it from Cachar. In Upper Pegu it appears to be not uncommon, and Blyth recorded it from Tonghoo, although Messrs. Hume and Davison have not found it in Tenasserim. Mr. Fairbank met with it up to 4000 feet in the Palanis.

Habits.—This showy little bird is one of the most interesting of our Flycatchers; it frequents little groves of trees, or those standing isolated on patnas and semicultivated ground, jungle on the borders of tanks, and open grassy glades, and in the Eastern Province cocoanut-topes in the vicinity of villages. It is a fearless species, and when not paired for breeding is usually of solitary habit. At this time its manners are most amusing; for the male, in his endeavours to attract the attention of his consort, displays a nature much akin to that of the Peacock, and seems to delight in displaying his prowess to mankind as well as to his own order. He will sometimes alight on a tree close to a bystander, and proceed with a measured little pace either along a horizontal trunk or up a slanting branch, with an outspreading movement of its wings and a gentle oscillation to and fro of its body, combined with an expanding and contracting of its long tail, the whole reminding one of the balance-step in a hornpipe! Not less singular is its remarkably human-like whistle, uttered in an ascending scale for the edification of its mate; and when this proceeds, as it sometimes does, from a thickly foliaged tree, completely hiding the performer from view, it is difficult to persuade one's self that it is made by a bird. It is very active in catching its prey, and, as Jerdon remarks, does not fly far after it, but snaps it up with a sudden dart. I have seen it on the ground, stalking about in the manner above described; and

Jerdon says that he has seen it alight on the back of a cow; he states that its chief food consists of "mosquitos and other small dipterous insects, as also the small *Cicadellæ*" which are abundant in India.

Nidification.—This Flycatcher breeds in Ceylon during the early part of the year. I have not had the good fortune to see its cleverly-constructed little nest myself; but Mr. Jefferies, of Gangaroowa estate, described to me one, which was constructed in an orange-tree in his compound at Hindugalla, as being a beautiful little cup-shaped structure, placed on a thin branch, which oscillated to and fro with the wind, and which the architect, with wonderful skill, had tied to an adjacent branch with a "stay" consisting of a fine creeper-tendril. This is so extraordinary, that had not my friend been a well-known observer of bird life and very fond of natural history, I could scarcely have credited the statement. The nest is described by various writers quoted in 'Nests and Eggs' as being a hemispherical or elegant oval little cup, composed of fine grass-stems coated with cobwebs, or fine plant-stalks plastered with "cotton" and seed-down, the internal diameter being about 2 inches and the depth 1 inch. Mr. Hume speaks of one he found at Bareilly as being a "delicate tumbler-like affair, scarcely $\frac{1}{4}$ inch thick anywhere, closely woven of fine grass, and thickly coated over its whole exterior with cobwebs." The eggs are usually three in number, the ground-colour varying from pure white to yellowish brown or dingy cream-colour, spotted and speckled in a broad irregular zone near the large end with greyish brown, "at times intermingled with spots or tiny clouds of faint inky purple." Average size 0·66 by 0·51 inch.

Genus ALSEONAX.

Bill wide at the base, stout, triangular, the under mandible rounded beneath and *pale at the base*; rictal bristles long. Wings with the 2nd quill longer than the 6th, and the 3rd and 4th the longest. Tail shorter than the wings and even at the tip. Legs and feet small.

ALSEONAX LATIROSTRIS.

(THE BROWN FLYCATCHER.)

Muscicapa latirostris, Raffl. Tr. Linn. Soc. xiii. p. 312 (1821).

Muscicapa grisola, var. *dauurica*, Pall. Zoogr. Rosso-Asiat. i. p. 461 (1831).

Hemichelidon latirostris, Gray, Gen. B. i. p. 262 (1845); Blyth, Cat. B. Mus. A. S. B. p. 175 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 137 (1856).

Butalis latirostris, Blyth, J. A. S. B. 1847, xvi. p. 121; Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 127; Kelaart, Prodromus, Cat. p. 123 (1852).

Alseonax latirostris, Cab. Mus. Hein. i. p. 53 (1850); Jerdon, B. of Ind. i. p. 459; Holdsw. P. Z. S. 1872, p. 441; Hume & Henderson, Lahore to Yark. p. 185, pl. v.; Walden, Ibis, 1873, p. 308; Hume, Str. Feath. 1874, p. 219; Bourdillon, ibid. 1876, p. 396; Hume (B. of Tenass.), Str. Feath. 1878, p. 227; Sharpe, Cat. B. iv. p. 127 (1879).

Alseonax terricolor, Brooks, Str. Feath. 1877, p. 470.

Zukki, Hind. (Jerdon); *Shima-modzu*, Japan (Blakiston).

Adult male and female. Length 5·1 to 5·3 inches; wing 2·7 to 2·95; tail 2·2; tarsus 0·55; mid toe and claw 0·6; bill to gape 0·6.

Iris brown; bill, upper mandible blackish, lower fleshy with dark tip; legs and feet dark grey or wood-brown.

Lores mingled grey and white; an orbital fringe of fulvous; head and upper surface light cinereous brown, slightly darker on the head; wings and tail hair-brown; wing-coverts pale-margined, inner secondaries and tertials with broad fulvous-grey edgings; tail tipped pale; chin albescent, darkening on the fore neck and chest into cinereous grey; breast and lower parts white; flanks cinereous grey.

The amount of pale edging on the wing-coverts and secondaries varies considerably. Mr. Hume, too, notices this character in ‘Stray Feathers.’

Young (nestling: Nepal). Above brown, slightly tinged with rusty on the upper tail-coverts, and each feather of the upper surface with an elongated central spot of greyish near the tip, which becomes fulvous on the rump and upper tail-coverts; wing-coverts with deep terminal edgings of fulvous; inner secondaries the same; quills margined internally with rufescent; ear-coverts tipped with dark brown; under surface whitish, the fore-neck feathers tipped with dusky; flanks dusky.

Obs. I have examined a large series of this Flycatcher from Japan, China, India, the Andamans, Java, Sumatra, Borneo, and Saigon, and am of opinion that there is but the one species, with perhaps a local race, which is rusty-coloured on the upper surface, but similar beneath to our bird, in Cochin China and Borneo. Examples from Japan, nine of which I have examined, are identical to all intents with those which visit Ceylon; they are perhaps greyer on the back and not quite so brown on the chest and flanks; they vary in the wing from 2·6 to 2·85 inches, and in the bill are the same as ours. A Tenasserim example (w. 2·6) is slightly more “earthy” than Ceylonese examples on the rump, and one from N.W. Himalayas still more so; two from Port Blair are positively identical with specimens killed in Ceylon. A Javan bird is very rusty-coloured on the nape and edges of the wing-coverts, therein approaching a Sarawak bird, which measures in the wing 2·55 inches only, and which is very “rusty” on the upper surface, the ferruginous tint increasing towards the rump; the wing-coverts are margined and tipped with ferruginous; and, in fact, were it not for the under surface, which is almost exactly the same as specimens from India and elsewhere, the bird would have the appearance of *Hemichelidon ferrugineus.* An example from Saigon is much the same as the last. These birds might well form a subspecies, I think; but I see that Mr. Sharpe, in the 4th vol. of his great ‘Catalogue of Birds,’ unites the races from all parts in one and the same species. Mr. Hodgson's specimens of *A. terricolor* in the British Museum are in bad order; but they are clearly nothing but the present species.

Distribution.—This modest little bird is a cold-weather visitant to Ceylon, coming to us from South

India in October and departing again in the following April. It spreads over the whole low country, but is nowhere very plentiful, and liable to be passed over, as it is of solitary habits. From the low lands it ascends into the coffee-districts to an altitude of about 3500 feet. About Colombo and on the west coast generally it is fairly common, inhabiting trees in the vicinity of houses or even in the town itself, and it is liable to be met with anywhere in the interior.

It was described from Sumatra by Raffles, but does not appear to have been procured there of late years, although it is not uncommonly met with in Java, Borneo, and Malacca; it is of course a winter visitor to all this region and also to the Andamans, where Lieut. Wardlaw Ramsay procured it in December, January, and February. According to Swinhoe it summers in China, and does the same in Japan and Eastern Siberia, in which regions it no doubt chiefly breeds, and from which it migrates at the latter end of the year to India, Tenasserim, and Malasia. In Tenasserim, singularly enough, Mr. Hume says that it has only been observed in the southern half of the province. It does not appear to be found in Burmah, and is not recorded by Mr. Inglis from Cachar; it is therefore somewhat difficult to follow its line of migration to India from China and North-eastern Siberia; and it may be that the birds which visit the plains of India, the southern part of the peninsula, and Ceylon breed in the Himalayas. Jerdon writes that *A. terricolor* of Hodgson inhabits the Himalayas at no great elevation, and visits the plains in the cool season, which implies, of course, that it summers in the mountains; it will be observed also that the young bird which I have described above is from Nepal. It does not extend into North-western India, keeping quite to the east until it gets to the Deccan, where Messrs. Davidson and Wender obtained it at Sholapoor and Mr. Fairbank at Khandala. In the Travancore hills Mr. Bourdillon says it is common during the winter months.

Habits.—This Flycatcher resembles in its economy the common species of Europe (*Muscicapa grisola*), and reminds one much of this latter species. It takes up its abode in shady trees, often in the middle of towns and villages, or on the borders of streams, in native gardens, and even in the recesses of the dry forests of the north. It chooses in the latter localities a spot which is cheered by the rays of the sun, and quietly perches on the low branch of a tree, every now and then making an active dart on a passing insect and returning with it to its perch. It is very silent and exceedingly tame, sitting fearlessly in the most public situations, entirely regardless of the busy hum of human life. It now and then utters a weak note after catching an insect, and will then sit perfectly motionless until it espies some other object of pursuit.

NENSIS

ALSEONAX MUTTUI.

(THE RUSTY FLYCATCHER.)

(Peculiar to Ceylon.)

Butalis muttui, Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 127; Legge, Ibis, 1878, p. 203.
Alseonax ferrugineus, Jerdon, B. of Ind. i. p. 460, in part (1862).
Alseonax terricolor (*nec* Hodgs.), Holdsw. P. Z. S. 1872, p. 441; Layard, P. Z. S. 1873, p. 204; Legge, Str. Feath. 1875, p. 366.
Alseonax flavipes, Legge, Str. Feath. 1875, p. 367.
Alseonax muttui, Sharpe, Cat. B. iv. p. 132 (1879).

Suprà brunneus, pileo saturatiore, supracaudalibus magis rufescentibus: tectricibus alarum minimis et medianis dorso concoloribus, majoribus brunneis, fulvescenti-rufo marginatis: tectricibus primariorum primariisque brunneis, secundariis fulvescenti-rufo marginatis: rectricibus brunneis, pallidiore brunneo limbatis: loris et annulo ophthalmico albidis: regione paroticâ brunneâ: gutture albo: genis cum pectore et corporis lateribus pallidè brunneis fulvescenti lavato: pectore medio et abdomine purè albis: subcaudalibus fulvescenti-albidis: subalaribus et axillaribus cervinis: remigibus infrà brunneis, intùs cervino marginatis: rostro nigricanti-brunneo, mandibulâ flavicante ad apicem brunneâ: pedibus pallidè flavis: iride rufescenti-brunneâ.

Adult male and female. Length 5·3 to 5·5 inches; wing 2·7 to 2·9; tail 2·1 to 2·2; tarsus 0·55; mid toe and claw 0·57; bill to gape 0·7 to 0·75. The legs and feet are exceedingly delicate in this species.

Iris hazel-brown; bill, upper mandible dark brown with pale tip, under mandible fleshy yellow; legs and feet pale yellow; eyelid dark plumbeous. In one female the tip of the upper mandible is pale.

Lores, orbital fringe, and a spot beneath the gape whitish; head and upper part of hind neck dark olive-brown, changing into rusty olivaceous on the back, which deepens to ferruginous on the rump and upper tail-coverts; wings dark brown, the primaries with a fine pale edging, and the coverts and tertials conspicuously edged with yellowish ferruginous; tail slightly lighter brown than the wings, margined with rufous-brown; chin and throat white, bounded on each side by a dark cheek-patch; chest brownish, the feathers margined with fulvous; breast and under tail-coverts white, flanks light yellowish brown; wing-lining brownish, paling off into fulvous.

Obs. This Flycatcher was united by Mr. Holdsworth, in his 'Catalogue,' with *Alseonax terricolor*, Hodgson; but this species is identical with the last. There is no doubt that Layard's bird was the same as the subject of the present article; he makes, it is true, no mention of the yellow legs and feet which are so characteristic of it; but his description, though somewhat scanty, is sufficient to preclude my keeping my specimens as distinct under the title of *A. flavipes*. He writes as follows:—"General resemblance of *B. latirostris*, but of a far more rufous colour; this colour most prevalent on the outer webs of the wing-primaries, the outer tail-coverts, and the sides of the breast and belly; throat, belly, and vent whitish; breast rufous ashy; back of the head dark brown. Length 5·0 inches, wing 3·0." This is, I think, near enough to identify his bird with the specimens I have procured in the island.

Cyornis mandellii (Hume, Str. Feath. 1874, p. 510) turns out to be a very closely allied representative of this species, inhabiting Sikhim and the hill-region of Southern India. Since this article was penned, the British Museum has acquired a specimen of this species from the collection sent home lately by Mr. Hume. It was labelled, in error, as a female *Cyornis magnirostris*, but it corresponded with Mr. Hume's description of *C. mandellii*. On Mr. Sharpe and myself comparing it with the Ceylon bird, it proved to be closely allied to it, and a member of the genus *Alseonax*, having the pale lower mandible which does not exist in *Cyornis*, and likewise the wing-formula of the first-named genus. It is almost identical on the upper surface with the insular bird, the head being only slightly darker; but the under surface is very much darker, the flanks are much browner, and the whole breast instead of being white is tawny brown, the vent and under tail-coverts only being white; the chest is much browner than in *A. muttui*, and the white throat-patch smaller. In Mr. Hume's original description he says, "the breast, sides, and flanks are pale brown." The dimensions of this specimen are—wing 3·0 inches, tail 2·5; the legs are in the dried skin dusky yellow, and they are more robust than those of the insular form. *Alseonax ferrugineus*, now placed by Mr. Sharpe in the genus *Hemichelidon*, is in its coloration not far distant from these two species;

but it is much more rufous, particularly on the back, rump, upper tail-coverts, and edgings of the wing-coverts, and the lower parts are also much more rufescent.

Distribution.—This rare Flycatcher was discovered by Layard at Pt. Pedro, the extreme north of the island; he writes thus of it, after describing the specimen brought to him:—"I name this new species after my old and attached servant Muttu, to whose patient perseverance and hunting skill I owe so many of my best birds. This one he brought to me one morning at Pt. Pedro during the month of June." I am not aware that it was again met with until rediscovered by myself in January 1875, when I obtained one of two specimens seen in forest a few miles from Trincomalie. After that date I did not notice it until February 1877, when I met with several individuals in the forest of Ikkade Barawe, in the Hewagam Korale, and procured three or four of them. It is not improbable that it may inhabit other forests in the south and east of the island; for after I had obtained the above examples I came to the conclusion that Flycatchers which I had not unfrequently seen in heavy forest in the last-named district and taken for the foregoing species, which really does not *commonly* affect such localities, may possibly have been no other than this interesting and little-known bird. I therefore commend the subject of a further acquaintance with it to such of my readers who have the opportunity of ornithologically examining the low-country forests of the island. It is singular that I have only met with it in the north-east monsoon, which would lead to the idea that it was migratory; and the late discovery by Mr. Bourdillon of *A. mandelli* in Travancore would tend to strengthen this suspicion did Mr. Hume make any mention of these southern specimens being white on the breast; he, however, appears to consider them identical with the dark Sikhim examples, as he does not speak of any difference in the under surface. I must add that Layard procured his specimen in June, which goes far to prove that the species is resident in, and peculiar to, Ceylon.

Habits.—This little bird has all the modest and retiring habits of its ally already noticed in the last article. I have always noticed it frequenting the lateral and rather low outspreading branches of forest trees by the sides of tracks, paths, or little open glades. It leads a sedentary life, sitting upright and motionless, and now and then waking into action by darting out at some passing fly. In the stomach of one example I found much larger insects (moderately sized Coleoptera) than I expected to find captured by so small a bird. It is the reverse of shy, not objecting to a close scrutiny, under which I found it would sit motionless until roused into flight by the sight of its prey, which to it was evidently much more worthy of attention than myself and the fatal weapon which was destined to put an end to its quiet existence.

The upper figure in the Plate accompanying the present article represents a male of this species shot in the Ikkade-Barawe forest, near Hanwella.

Genus STOPAROLA.

Bill very similar to *Alseonax*, equally broad, but slightly more robust, and the nostrils more basal; rictal bristles long and fine. Wings with the 2nd quill much shorter than in the last genus, about equal to the 8th; the 4th and 5th the longest. Tail shorter than the wings, even at the tip. Legs and feet rather stout. Tarsus as long as the middle toe and claw.

STOPAROLA SORDIDA.

(THE CEYLONESE BLUE FLYCATCHER.)

(Peculiar to Ceylon.)

Stoparola melanops (*nec* V.), Kelaart, Prodromus, Cat. p. 123 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 127.

Niltava ceylonensis, Gray, Hand-l. B. i. p. 326. no. 4897 (1869).

Glaucomyias sordida, Wald. Ann. & Mag. Nat. Hist. 1870, v. p. 218.

Eumyias sordida, Sharpe, Tr. Linn. Soc. new series, i. p. 326; Holdsw. P. Z. S. 1872, p. 441; Legge, Ibis, 1874, p. 18; Hume, Stray Feath. 1875, p. 401.

Stoparola sordida, Sharpe, Cat. B. iv. p. 440 (1879).

The Bluish Flycatcher, Kelaart.

Suprà sordidè viridi-cinerascens: tectricibus alarum minimis dorso concoloribus, medianis majoribusque cum remigibus rectricibusque fuscis, dorsi colore marginatis: fronte et supercilio antico lætè cyaneis: loris et plumis subocularibus nigris: facie laterali et corpore subtùs toto viridi-cinerascentibus: abdomine imo et subcaudalibus albicantibus maculâ ad basin mandibulæ et mento summo nigris: gulâ cyaneo lavatâ: tibiis cinerascenti-brunneis.

Adult male and female. Length 5·8 to 6·2 inches; wing 2·85 to 3·1; tail 2·3 to 2·5; tarsus 0·7 to 0·8; mid toe and claw 0·65 to 0·7; bill to gape 0·67 to 0·75.

Iris varying from reddish brown to brown; bill black; legs and feet dark plumbeous, the feet sometimes blackish, much darker than tarsus; claws black.

Head, hind neck, back, and wings sombre verditer-blue; the edge of the forehead and an ill-defined superciliary stripe lazuline blue; chin washed with the same; lores and extreme point of chin black; wings and tail blackish brown, edged with the blue of the back, the latter mostly towards the base; throat and chest bluish cinereous, blending with the brighter blue of the chin and paling on the breast, the lower part of which, with the under tail-coverts, is white. The amount of white on the lower parts and depth of blue of the upper surface vary, being perhaps dependent on age. In some examples the under tail-coverts alone are unsullied white. The greyish bases of the rump-feathers show in imperfectly-plumaged birds, imparting a pale appearance to that part.

Young. Iris brown; legs and feet duskier than in the adult. In the first plumage the head, back, and wing-coverts are brown, each feather with a fulvous centre, edged off with blackish; feathers of the chin and forehead entirely fulvous; throat and breast fulvescent grey, with dark edges. This dress is doffed a few months after fledging, and specimens in the mixed blue and spotted plumage to be met with in August and September have a curious appearance.

Obs. This species was identified by Layard as *Stoparola melanops*, the Himalayan representative of our bird, but which is a bright verditer-blue instead of the dull colour characteristic of the latter. Gray, in drawing up his 'Hand-list of the Birds in the British Museum,' evidently distinguished the two birds from one another, for he gave the Ceylonese form the name of *Stoparola ceylonensis*; but as he inserted this name in his list with a query as to the species being new, and gave no description, it is not accepted. It was not until 1870 that the late Lord Tweeddale, who states that he received four specimens from Ceylon, bestowed the present title on it. *Stoparola sordida* is more nearly allied to the South-Indian *S. albicaudata* than to the above-mentioned Himalayan species; the Nilghiri bird has the head, back, hind and fore neck a dull indigo-blue, the forehead and chin hyacinth-blue; wings and tail brown, edged with blue; the underparts pale bluish; bases of all but the central tail-feathers white, but they are quite concealed by these latter, which overlie them: an example in the national collection measures 3·1 in the wing. *S. melanops* is a larger bird; examples which I have examined from Darjiling, Murree, and Nepal measure from 3·3 to 3·45 in the wing.

Distribution.—This Flycatcher is entirely a hill-bird, inhabiting both the Kandyan and the southern mountains down to an elevation of somewhat under 2000 feet. It is not common at the Horton plains,

according to my observation; but it is abundant slightly lower down, at Nuwara Elliya, and throughout the main range. It is numerous in jungles throughout all the coffee-districts, particularly in the Knuckles and in Uva. Lower down it is less frequent, except in the secluded woods through which the affluents of the Mahawelliganga flow. It is found in the Singha-Rajah and other forests bordering the Kukkul Korale, and at a similarly low elevation on the south-eastern slopes of the Uva ranges.

Habits.—This is a quiet bird, of less active movements than most Flycatchers, and is usually found frequenting the outskirts of forest, the edges of clearings, the borders of mountain-streams, or the sides of roads and paths, in preference to the depths of the jungle. On a few occasions I have observed it in small flocks of half a dozen or more on the banks of broad, sunny torrents; but this is not usual. The male has a sweet little warble, which it patiently whistles all day long, particularly in the breeding-season, seated near its mate; and the note is so low and clear that it seems to come from a distance, whereas the bird is actually sitting close at hand.

It frequently perches on fallen trees and low stumps, on which it will sit in perfect silence until disturbed, when it does not take the trouble to fly far, but simply flits to the nearest inviting twig. It evinces little or no fear of man. Mr. Bligh, who has had much opportunity of observing its habits during a long residence in the coffee-districts, informs me that it is not sociably inclined, that the males are very pugnacious, and that when two meet they utter their song in a high key and in "a passionate hurried manner." He further writes:—"Its sweet plaintive notes are heard during many months of the year; it affects low perches from which to pour forth its contentment in song, such as the stump of a tree, a log or rock in the coffee, or an exposed branch by the jungle-side. Its song has a certain charm, possessing no small resemblance to the plaintive whistling of the Blackbird. It is a very silent bird except when singing; indeed I have never heard it utter a call-note beyond a scarcely audible 'sip' when it is near its nest."

Nidification.—From the pen of the same observant naturalist, Mr. Bligh, I gather the following information concerning the nesting of this interesting little bird. He says, "The nest is generally concealed in various suitable places, such as a shallow hole in a rotten stump or in the trunk of a forest tree; and I once found it in a felled tree, well protected by a thick branch of a coffee-bush which grew over it; it is composed of moss, lichens, and grasses lined with fine fibrous materials, and is like a Blackbird's in miniature. The eggs are dull white, thickly sprinkled and blotched with dark reddish."

The breeding-season would appear to be in April and May; for I have shot the young in mixed nestling and blue plumage in the month of August, both in the Peak and Kukkul-Korale forests.

The lower figure in the Plate accompanying my article on *Alseonax muttui* represents a male of the present species, shot at Debedde Gap in Uva.

Genus SIPHIA.

Bill not so wide as in *Stoparola*, compressed towards the tip; rictal bristles not so long; 1st primary very short, 2nd slightly exceeding the 8th; the 4th and 5th the longest, considerably exceeding the 3rd. Tail shorter than the wings. Tarsus shorter than in the last genus, but exceeding the middle toe without its claw.

SIPHIA TICKELLIÆ.

(THE BLUE REDBREAST.)

Muscicapa hyacintha, Tickell, J. A. S. B. 1833, ii. p. 574.

Cyornis banyumas (*nec* Horsf.), Blyth, J. A. S. B. 1843, xii. p. 941; id. Cat. B. Mus. A. S. B. p. 173 (1849); Jerdon, B. of Ind. i. p. 446 (1862).

Cyornis tickelliæ, Blyth, J. A. S. B. 1843, xii. p. 941; Jerdon, B. of Ind. i. p. 467; Hayes Lloyd, Ibis, 1872, p. 197; Hume, Str. Feath. 1873, p. 436; Ball, ibid. 1874, p. 405; Butler & Hume, ibid. 1875, p. 468.

Cyornis jerdoni, Gray, Hand-l. B. i. p. 325 (1869); Jerdon, Ibis, 1872, p. 125; Holdsw. P. Z. S. 1872, p. 442; Legge, Ibis, 1874, p. 18.

Siphia tickelliæ, Sharpe, Cat. B. iv. p. 447 (1879).

Marawa, Sinhalese.

Adult male and female. Length 5·6 to 5·9 inches; wing 2·7 to 2·95; tail 2·3 to 2·6; tarsus 0·65 to 0·7; mid toe and claw 0·65; bill to gape 0·7 to 0·77.

Male. Iris brown; bill blackish; legs and feet bluish brown, dusky bluish, or bluish grey.

Head and entire upper surface (including the sides of the neck), wings, and tail dull blue, brightening at the forehead, above the eye, and on the point of wing into shining cærulean blue; inner webs of the rectrices and quills and the outer primaries wholly blackish brown; lores, face, and along the base of the under mandible to the chin bluish black; throat (commencing at a point between the dark blue sides), neck, and chest fine fulvous rufescent, paling off on the sides of the breast and flanks to light fulvous, and leaving the centre of breast and abdomen with the under tail-coverts white.

Obs. In the damp southern forests are to be found dark rufous-chested examples of this species with a broad maxillary stripe exceeding that of specimens from other parts of the island by 0·1 inch, and with the abdomen and under tail-coverts very faintly washed with rufous, forming, in fact, a link between the present species and the Javan bird (*C. banyumas*). I possess such a specimen from the timber-jungles of Opaté.

Female. Bill less black; legs and feet bluish, paler than in the male.

Above a lighter or faded blue, with a less brilliant frontal stripe and shoulder-patch; *lores fulvous grey*; cheeks bluish, without the chin-stripe; chin whitish, deepening to light rufescent fulvous on the chest, and paling on the flanks as in the male.

Young male. Legs and feet light bluish. Head and hind neck brown, with fulvous-yellow mesial lines; back brown, suffused with fulvescent, and each feather with a terminal spot of the same; wing-coverts with deep tips of a brighter hue than the markings of the back; quills and tail as in the adult; beneath, the throat and chest fulvescent, with a faint indication of a stripe along the edge of the lower mandible, and the feathers of the chest edged dusky. The clothing-feathers are doffed at a very early age, and the blue of the back, together with the rufous hues of the underparts, soon assumed.

Young female. Legs and feet fleshy; upper parts duller brown than the male, with central stripes and terminal spots of fulvous; chest pale buff-white, darkly edged.

Obs. This is the species styled by Jerdon in his 'Birds of India' *Cyornis banyumas*, and afterwards named *C. jerdoni* by Gray in his 'Hand-list.' Blyth, however, had (*loc. cit.*) previously named a pale-chested Blue Redbreast *C. tickelliæ*; and this was afterwards found by Major Hayes Lloyd to be nothing but the female of Jerdon's bird. In 'The Ibis' for 1872, p. 197, he gives the history of this discovery in an interesting letter dated from Kattiawar; and subsequently, as Blyth's name had priority over Gray's, the species has been, as a matter of course, styled *C. tickelliæ*. Ceylon specimens do not differ from examples from various parts of India, although some individuals I have

examined from the latter present slight points of dissimilarity. Two males from Kattiawar (wings 2·8 and 2·9 inches), and another labelled "India" (wing 2·8), in the British Museum, have the breasts somewhat deeper rufous. An example from Yunnan has the lower parts tinged faintly with rufous, like my Opaté bird; and another, a female from the peninsula of India, is paler than insular females on the back, and has the abdomen and vent faintly tinged with rufous-buff. These instances tend to show that the Indian and Javan birds almost run into one another. In regard to the latter, *C. banyumas*, with which our species was formerly confounded, its only distinctive character lies in the belly and under tail-coverts being more or less washed with the rufous hue of the breast, instead of being white. I say, *more or less*, because some examples are much paler in this respect than others. A male from Bintulu, W. Borneo (wing 2·75), has the belly and under tail-coverts quite rufous; while two others from Labuan have these parts only slightly tinged with it, being very little deeper-coloured than the above-mentioned Southern-Ceylon example.

Distribution.—This Flycatcher is widely dispersed through the whole island, being an inhabitant of all forest and tracts of jungle, and is very numerous, being equally at home in the vast jungles of the north and east, and in the tall timber-forests of Saffragam and the south-western hill-district. In the Central Province it ranges up to 4000 feet, commonly in Uva, and more rarely in the western portions of Dimbulla, Maskeliya, &c. In the great forest-districts of the island its favourite habitat are the borders of rivers and tanks; but it is so common there, that it may be met with in any part of the jungle, and was in the Trincomalie district even an inhabitant of the isolated Ostenburgh woods between the harbour and the sea. In the south-west it is more abundant in the timber-forests on the banks of the Gindurah than elsewhere; but in parts of the Western Province (at Kaduwella and other places between Colombo and Saffragam, for instance) I have found it occupying the compounds and gardens of the natives, as well as the jungles surrounding the villages.

It is singular that a bird so common was not noticed by Layard during his travels through the island.

On the mainland this species extends from South India to the north-west of the peninsula, where it is found in the hilly tracts of Kattiawar, but nowhere else, according to Mr. Hume, in the circumjacent region, except at Mount Aboo, where Captain Butler procured it. Mr. Hume records it from Kumaon; and it doubtless occurs further east along the base of the Himalayas, as it has been got near Calcutta. It is not mentioned in 'Stray Feathers' as inhabiting Burmah or Tenasserim, although the late Marquis of Tweeddale says that it was obtained by Lieutenant Ramsay in Karennee. I am also unable to separate the example above cited, in Dr. Anderson's "Yunnan" collection, from Indian examples of the species. In Central India it is not uncommon; Mr. Ball procured it in the Satpura hills, and remarks that it is rare in Chota Nagpur. Mr. Fairbank writes that it is found everywhere in the Khandala district in suitable localities; and Messrs. Davidson and Wender record it from Sholapoor, in the Deccan. Jerdon writes that it inhabits the Carnatic and the Malabar coast, and Mr. Fairbank procured it in the Palani hills.

Habits.—This pretty bird frequents a variety of situations in jungle and forest, avoiding, however, the thorny scrubs in the dry coast-districts; it is very partial to tall underwood beneath the gigantic trees which line and overhang the river-banks in the Northern and Eastern Provinces, or rear their majestic heads in the shade of the lofty precipices which scarp the rocky ranges of the Park country. In such spots, which foster the life of myriads of tropical insects, these little birds ply their busy vocation, the male constantly piping out its sweet quick little whistle, resembling somewhat the syllables *tee-titi-wit-titu-weee*, which is answered by the female with a monosyllabic "chit" note. In the dusk of the evening it is a most restless bird, the male resorting to some overshadowed thicket, and flying from branch to branch, repeatedly uttering its whistle, which is continued long after the dense surrounding forest has shut out the last rays of departing daylight. It is at these times very difficult to catch sight of, its dark blue plumage assimilating with the gloomy aspect of the jungle. It is unsociable towards its fellows, the males strictly keeping at a distance from one another, even when there are several in the same glen or grove. During most part of the day it does not display any great activity, but rests, after the morning meal, on slender horizontal branches, now and then making a sally at a passing insect.

Nidification.—In the Western Province I have shot the young in nestling-plumage at the end of June,

and in the Northern Province in the middle of July, so that the breeding-season of this Flycatcher may be said to be May and June throughout the island. I obtained no information concerning its nest and eggs while in Ceylon; but on reference to 'Nests and Eggs of Indian Birds,' I find that it nests in a niche in a wall or in a hole between branches of a tree at no great height from the ground. A nest taken by Miss Cockburn is recorded by Mr. Hume as being made of "moss and moss-roots, the latter forming the lining, a good many dead leaves being incorporated in the exterior surface; it was between 3 and 4 inches in diameter externally, and the egg-cavity was very shallow." In shape the eggs are said to be moderately long ovals, somewhat obtuse at the small end; the ground-colour is dingy greyish white, very finely freckled and mottled with dingy reddish brown, the markings being everywhere indistinct and feeble, but concentrated and nearly confluent towards the large end, forming a zone or irregularly defined cap. In some specimens the markings are very closely set, so that the eggs appear to be of a pale brownish-rufous colour. The average dimensions of five eggs are 0·76 inch in length by 0·56 inch in breadth; they have, as a rule, a faint gloss.

SIPHIA RUBECULOIDES.

(THE BLUE-THROATED REDBREAST.)

Phœnicura rubeculoides, Vigors, P. Z. S. 1831, p. 35; Gould, Cent. Him. Birds, pl. 25. fig. 1 (1832).

Muscicapa rubecula, Swains. Monogr. Flyc. p. 221, pl. 27.

Cyornis rubeculoides, Blyth, J. A. S. B. 1843, xii. p. 941; id. Cat. B. Mus. A. S. B. p. 173 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 125; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 289 (1854); Jerdon, B. of Ind. i. p. 466 (1862); Holdsw. P. Z. S. 1872, p. 442; Hume, Nests and Eggs, 1873, p. 211; id. Str. Feath. 1875, p. 104; Brooks, *t. c.* p. 235; Hume, Str. Feath. 1878, p. 227.

Niltava rubeculoides, Gray, Gen. B. i. p. 264.

Siphia rubeculoides, Sharpe, Cat. B. iv. p. 445 (1879).

Chatki, Beng.; *Manzhil-pho*, Lepchas (Jerdon).

Adult male. Length 5·6 to 5·8 inches; wing 2·7 to 2·8; tail 2·0 to 2·2; tarsus 0·7; mid toe and claw 0·6; bill to gape 0·7.

Female. Length 5·3 to 5·5 inches; wing 2·7 to 2·8.

Male. Iris deep brown; bill black; legs and feet dusky bluish, claws dusky.

Head, hind neck, back, and wing-coverts dark shining blue; forehead and point of wing glistening cærulean blue, extending more above the eyes than in the last species; inner webs of the quills and tail-feathers blackish brown, the outer webs margined with blue, much brighter on the tail than the wing; upper tail-coverts brighter blue than the back; the lores, ear-coverts, and the extreme point of the chin black; throat and sides of chest deep obscure indigo-blue, descending further down to the chest in some specimens than in others; chest and upper part of the breast rich rufous, fading into white on the lower breast, abdomen, lower flanks, and under tail-coverts; under wing-coverts white.

The coloration of the throat is variable; in the majority of specimens from Ceylon the dark blue colour ends in a line *across* the lower part of the throat; but in some it extends considerably upon the sides of the chest, confining the rufous of the chest to a smaller space, while in others the rufous runs up in a point towards the chin, dividing the blue of the throat. This exists in an example in my collection, and Mr. Holdsworth noticed it in specimens from Ceylon in the late Lord Tweeddale's collection.

Female. Bill dark brown; legs and feet greyish blue.

Above uniform brownish olive, with the margins of the quills pale, and the upper tail-coverts and tail suffused with rusty brown; lores pale; orbital fringe rufescent; ear-coverts with pale striæ; throat and chest dull rufous, paling on the flanks; the breast, abdomen, and under tail-coverts pure white; wing-lining yellowish buff.

Young male. Iris light brown; bill blackish, pale at the base; legs and feet bluish.

Above bluish, with fulvous tips to the feathers of the head and neck, and terminal spots of the same on the wing-coverts; chin, throat, and breast rufescent buff, darkest on the chest, and changing into white on the lower parts. The above is the plumage in which I shot a Flycatcher changing from nest-plumage to the blue dress, in January 1875, in the forests near Kanthelai tank. There is an indication of a dark line across the throat, just where the lower border of the blue would be in the adult. It was in company with what appeared to be, as well as I could gather at a momentary glance in the thick jungle, an adult *C. rubeculoides*; and near at hand I obtained a glimpse of what I took for a brown *Cyornis*, which would be the colour of the female parent, provided my identification were correct.

Obs. I observe, on examining a continental series of this bird, the same variation in the marking of the throat

which I have alluded to in the case of Ceylon birds. Mr. Hume especially dwells on this point in connexion with the Tenasserim individuals referred to in his exhaustive treatise on the birds of that province, and says that in twelve out of fifteen adult males the rufous of the chest runs up in a stripe towards the chin, and in one the entire chin and throat are concolorous with the breast. It is difficult to see how this latter specimen can be *C. rubeculoides*; it would appear more likely to be *C. tickelliæ*. In three examples from the North-west Himalayas, which have the wings 2·95, 2·8, and 3·0 inches respectively, I find that the blue runs straight across the throat at a distance of 0·7 inch from the chin in two, and in the third the rufous runs up in a point towards the chin. In a Darjiling specimen the blue of the throat is very deep in colour, and descends down upon the sides of the chest; wing 2·7. In a Pegu example the rufous runs up the blue throat to within 0·4 of the chin; wing 2·6: in one from Madras the same is the case; wing 2·8. In no specimen in the British Museum does the rufous extend higher than within 0·4 of the chin; but I observe that Mr. Hume says it does so in rare instances. A presumed female in the national collection from the Bhootan Doars is much paler rufous on the chest than a Ceylon example; and I notice that Mr. Blanford observes this character (Str. Feath. 1877, p. 484) in a series procured in the same district by Mr. Mandelli, in which also the throat is always whitish. A doubt is expressed whether all the specimens referred to were really females, as they were not sexed; it is possible, therefore, that these birds may represent a distinct species.

Cyornis elegans, from Malacca, Borneo, and Sumatra, is described as having the throat bright cobalt-blue, as well as the forehead and shoulders of the wing, and must be regarded as a brighter-coloured ally of the present species.

Distribution.—I take this Flycatcher to be migratory to Ceylon. I have met with it in various parts of the northern forests, but only between the months of October and April. Layard was of the same opinion, and writes as follows:—"I obtained a few specimens of this elegant little Flycatcher during their migration from the mainland. I first shot them on the 14th of October 1851, and a few subsequently at Pt. Pedro; they then disappeared, and I saw no more of them." I never met with it in the western, southern, or eastern districts

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SIPHIA NIGRORUFA.

(THE BLACK-AND-ORANGE FLYCATCHER.)

Saxicola nigrorufa, Jerdon, Cat. B. S. India, Madr. Journ. 1839, x. p. 266.

Ochromela nigrorufa, Blyth, J. A. S. B. 1847, xvi. p. 129; id. Cat. B. Mus. A. S. B. p. 173 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 126; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 289 (1854); Jerdon, B. of Ind. i. p. 462 (1862); Holdsw. P. Z. S. 1872, p. 441; Hume, Nests and Eggs, i. p. 207 (1873); Bourdillon, Str. Feath. 1876, p. 396; Fairbank, ibid. 1877, p. 401.

Siphia nigrorufa, Sharpe, Cat. B. iv. p. 455 (1879).

Orange Robin, Jerdon.

Adult male and female. Length about 5·0 inches (Jerdon); wing 2·3; tail 1·9 to 2·0; tarsus 0·7; middle toe and claw 0·6; bill to gape 0·55. The above measurements, with the exception of the length, are from a series of four skins in the British Museum.

"Iris hazel-brown; bill black; legs and feet dirty reddish" (*Jerdon*).

Male. Head, face, ear-coverts, hind neck, and a line along the under mandible to the chin blackish brown, tinged with an olive hue; wings very dark brown, the coverts blacker than the quills; rest of the plumage orange-rufous, darkest on the back and sides of the neck, and paling into rufescent fulvous on the abdomen.

Female. Head, face, and hind neck olive-brown, the frontal feathers with rufous centres; ear-coverts striated with whitish; remainder of the plumage as in the male, but with the abdomen white; orbital fringe rufous.

Distribution.—The evidence on which this curiously-coloured Flycatcher has hitherto been included in our lists rests on a drawing of a bird, asserted by Layard to represent it, made by Mr. E. L. Mitford, of the Ceylon Civil Service.

of the island, although I shot many examples of the foregoing on the chance of their proving to be the present species. It is evidently a rare bird. Mr. Holdsworth mentions having seen examples in Lord Tweeddale's collection which were collected, I believe, by Mr. Chapman; but besides these, Layard's and my own specimens are in all probability the only ones procured in the island. If I am right in my identification of the young of this bird alluded to in the above "description," it is a remarkable fact that it should breed as a visitor to Ceylon, and at such a time of the year.

Its chief home appears to be the sub-Himalayan region, whence it migrates to the plains of India in the cool season. In Burmah, however, and likewise in Tenasserim (if the bird inhabiting the latter province really be this species) it appears to be resident. Mr. Oates says, as regards Pegu, "this species is common all over the hills, and I have lately received it from Arracan." Blyth remarks that it is not rare in the vicinity of Calcutta during the cold weather. Mr. Brooks says it is common in the lower parts of the valley of the Bhagirati river above Mussoori in May; and Captain Hutton writes, in the 'Journal of the Asiatic Society of Bengal' for 1848, that it arrives there in April to breed, from which it appears that it is not resident in all

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This gentleman was devoted to the study of natural history, and collected many birds, particularly in the Ratnapura district, in which he is said to have procured the present species. It is not improbable that the drawing was a faithful one, and that Layard rightly identified the species which it was intended to represent; but, on the whole, I do not consider the testimony quite sufficient to warrant my giving it a well-established position in the Ceylonese avifauna, and I therefore include it as a doubtful species in my list. Mr. Mitford asserts that it was migratory, *appearing in June*: in this he doubtless was mistaken, as no South-Indian species migrates to Ceylon at that season of the year; and were it merely a local migrant to that district from other parts, it would have been observed elsewhere in the island. No evidence, however, other than the above is forthcoming of this Flycatcher ever having been procured or seen in Ceylon: and it is a bird which it would be impossible to overlook, on account of its remarkable colouring.

The haunts of this species are the ranges of mountains in the south of the peninsula. Jerdon, who named and discovered it, writes of it, "This prettily-plumaged bird I have only met with on the summit of the Nilghiris, in the dense woods of which it may occasionally be seen;" he also states that it has been found on the highest mountains of Ceylon. This is a reference to Mr. Mitford's supposed discovery; but the Ratnapura district lies at the *foot* of Adam's Peak. Recently Mr. Bourdillon observed it in the Travancore hills, remarking that it frequents "dense wood-thickets, from 2500 feet elevation upwards;" and Dr. Fairbank likewise met with it "in groves at the top of the Palanis, as well as at Shemiganur, 5500 feet elevation."

Habits.—Jerdon writes concerning this Flycatcher, "It frequents the dense woods, preferring the most retired shady and damp swampy spots. Here it may be seen seated motionless on the low branch of a tree or a fallen stump, or some thick tangled dead branches, every now and then making a short swoop at an insect in the air, or descending to the ground for a second to pick one up. It is a very silent bird, and I never heard its note." Dr. Fairbank, who found it affecting similar situations, says, "It is difficult to see this little bird in the dense thickets it inhabits at a distance sufficient to shoot it without tearing it to bits." With regard to its habits in Ceylon, I am only able to quote Layard's notes, in which he says that Mr. Mitford found it feeding much on spiders, which is a singular practice for a Flycatcher.

Nidification.—In the Nilghiris this Flycatcher breeds at elevations of 5000 to 7000 feet, and lays from March until May. The nest is an extraordinary structure, being of a large globular form, made of dry sedge-flags and very coarse marsh-grass on a foundation of dead leaves. It is usually built at a height of 1 to 3 feet from the ground, and sometimes actually on the ground, as recorded by Mr. Darling in Hume's 'Nests and Eggs.' This gentleman writes:—"The nest is globular, higher than it is wide, with a small entrance-hole at one side, below which the nest is a little drawn in, and above which the dome projects somewhat. The foundation of the nest is almost always composed of dry leaves or fern, and the rest of it is woven of reed-leaves and flags; there is no lining, the eggs resting on the soft reed-leaves; it is exteriorly about 6 or 7 inches high and 4 broad, and the diameter of the central spherical cavity is about 3 inches." The experience of Mr. Davison is similar; a nest he found was made of the dry leaves of a kind of reed common on the Nilghiris. The eggs are two or three in number, of a pale brownish salmon-colour, indistinctly mottled with a darker colour, the markings coalescing to form a zone or cap at the larger end; some are pale greyish white, thickly and very finely speckled all over with very faint brownish red, forming a pale brownish-red cap. They measure 0·7 by 0·53 inch.

parts of its Himalayan habitat. It does not appear to have been procured in the south of India by Messrs. Bourdillon and Fairbank; but Jerdon obtained it both on the eastern and western coasts of that part.

Habits.—This species is exceedingly active and restless; it delights in dense low jungle growing beneath lofty trees, and appears to remain much in the same spot throughout the day. I have more than once found it in the low tangled wood which always grows on the upper or yearly inundated side of village tanks in the Northern Province. It perches on low branches, and darts very quickly on its prey, constantly changing its position. It has a very lively whistle, more varied and continued longer than that of the last species; and I have seen it flying in an excited manner backwards and forwards in a thicket, repeatedly uttering its song. Mr. Brooks styles its note "sweet and Robin-like;" and Hutton remarks that the male has a "very pleasing song, which it warbles forth from the midst of some thick bush, seldom exposing himself to view." I have found small caterpillars, as well as flies and minute insects, in its stomach.

Nidification.—From what has been said above, it will be seen that this Flycatcher may perhaps occasionally breed in Ceylon during the north-east monsoon; but it cannot be its habit to nest at that season. In the Himalayan districts it was observed by Capt. Hutton to breed in June, while Hodgson affirms that it begins to nest in April. It builds in a cavity in the trunk of a decayed tree or in the side of a rock, constructing its nest of moss, moss-roots, grass, and dry leaves, and lines it with black, fibrous moss-roots or hair-like lichens. The eggs are said to be dull pale olive-green, faintly or indistinctly clouded with dull rufous or clay-colour. Mr. Hume says the average size of the eggs he has seen is 0·73 by 0·62 inch.

Genus MUSCICAPA.

Bill small, not very wide at the base, and compressed towards the tip, which is scarcely decurved. Nostrils concealed by their plumes. Wings with the 1st primary shorter than in *Siphia*, the 2nd equal to the 7th, and the 4th the longest, slightly exceeding the 3rd. Tail rather broad, emarginate or even at the tip. Tarsus moderately long, exceeding the middle toe with its claw.

MUSCICAPA HYPERYTHRA.

(NIETNER'S ROBIN FLYCATCHER.)

Siphia hyperythra, Cabanis, Journ. für Orn. 1866, p. 391; Walden, Ibis, 1872, p. 472.
Menetica hyperythra, Cabanis, Journ. für Orn. 1866, p. 401.
Niltava hyperythra, Gray, Hand-l. B. i. p. 326. no. 4901 (1869).
Erythrosterna hyperythra, Holdsw. P. Z. S. 1872, p. 442, pl. 17; Hume, Nests and Eggs, p. 217 (1873); Brooks, Str. Feath. 1875, p. 236.
Muscicapa hyperythra, Sharpe, Cat. B. iv. p. 163 (1879).
The Robin, Planters in Ceylon.

Adult male. Length 4·6 to 5·1 inches; wing 2·6 to 2·7; tail 2·0; tarsus 0·7 to 0·8; mid toe and claw 0·6 to 0·65; bill to gape 0·6.

Female. Slightly smaller; wing 2·5 to 2·6 inches.

Iris hazel-brown; bill above brown, pale next the forehead; gape and lower mandible fleshy yellow, with the tip dusky; inside of mouth yellow; legs and feet deep brown; soles yellowish.

Male. Head and upper surface dusky cinereous brown, changing to ashen on the face and sides of neck; wings brown, edged with cinereous, the margins of the greater coverts being slightly ochraceous; upper tail-coverts, four centre tail-feathers, and terminal portion of the rest with all but the base of the outer web of the lateral feather black; these latter, the two next pairs, and the outer web of the adjacent are white for two thirds of the length from the base; lores ashen; orbital fringe dusky grey; chin, throat, breast, and sides of belly rich rufous, changing to white on the belly and vent, and bounded on the fore neck by a bold *black border* from the gape to the upper flanks; under tail-coverts yellowish buff and concolorous with the lower flanks; under wing-coverts the same.

Female. Upper surface with a more earthy tint than the male; the black of the tail not quite so intense; lores pale, orbital fringe greyish; ear-coverts pale-shafted; chin, throat, and upper breast less bright than in the male, and not divided from the hue of the hind neck by a black border.

Young. Bill paler than in the adult; legs and feet plumbeous brown.

Males in first plumage have the chin, throat, and lower breast white, with a rufous wash across the chest: this afterwards deepens and spreads up the throat, in which stage the black border begins to appear, and *distinguishes it from the young female*; from this to the adult stage all gradations of rufous colouring in the chest exist.

Females in nestling plumage are paler brown above than adults; the lores, cheeks, and orbits the same; chin and chest greyish, with a slight ochraceous tint on the latter; flanks and under tail-coverts faintly tinged with fulvous.

Obs. This Robin Flycatcher is the Indian representative of the European species *M. parva*, to which it is closely allied, differing from it in the presence of the black border which separates the rufous throat from the ashen sides of the neck. A male example of *M. parva* from Etawah measures 2·7 inches in the wing, and has the throat and fore neck, but not the chest, paler rufous-orange than in *M. hyperythra*; and the back is of a more earthy hue than that of the latter species; the three outer pairs of tail-feathers are marked similarly, but the fourth has some white on the inner web, as well as the outer.

Distribution.—Interesting as are the movements of migratory birds, there are one or two of our Ceylonese visitants which, for the ornithologist, possess a more than ordinary amount of attraction, inasmuch as they mysteriously appear in the island from well-known distant summer quarters without having left any trace of their presence in the regions through which they would naturally be disposed to pass, thereby rendering their line of migration a matter of conjecture. Of these the present species forms one of the most remarkable instances in our list. It is migratory to Ceylon, and yet was *first discovered* there so recently as 1860 by

Mr. Nietner, a German gentleman residing in the Pundooloya coffee-district; it appears, moreover, to be more plentiful in the island than in any other part of the mainland in which it has been observed. Previous to its being discovered it must therefore have been passed over by naturalists working in the Central Province; it is every season more or less common in that part, and now that its existence in the island has been made known it is frequently shot in the Nuwara-Elliya and surrounding districts. Mr. Holdsworth, however, was the second naturalist to procure it in Ceylon, obtaining specimens near Nuwara Elliya in 1870; and on the publication of his catalogue in the 'Proceedings of the Zoological Society' for 1872 he added the species to the Ceylonese avifauna. It arrives in October, and does not even appear to have been noticed in the northern province during transit; it is in the upper hills that it is first observed, and it takes up its quarters in no locality that I am aware of under an elevation of 2500 feet. It inhabits the Horton Plains, the whole of the main range, the Haputale and other Uva ranges, the upper parts of the Peak forest, and all the surrounding coffee-districts above the altitude I have named. Its appearance in the coffee-districts is, notwithstanding, somewhat irregular, being plentiful during one season in certain places, from which, in the following year, it may be totally absent. Mr. Bligh has noticed this fact in the Kotmalie and Haputale districts, and I myself found it common on the Rambodde pass in 1876–77, a locality where it has rarely been previously observed. It was described by Cabanis (*loc. cit.*) from the specimen sent to him by Mr. Nietner.

On the continent it has only been observed in the sub-Himalayan region. The first specimen sent home from India was, Mr. Holdsworth writes, obtained at Goona, in Cashmere; Mr. Brooks records, in 'Stray Feathers,' 1875, the procuring of an example near Mussoori in the beginning of May, and adds that "it is not an alpine bird." If this be the case it is difficult to conjecture where it breeds, as it has not been observed in Bengal. The same writer, however, makes a subsequent contrary statement, and says (Str. Feath. 1877, p. 471), "*Erythrosterna hyperythra* appears to be a resident hill-species." The singular fact of its not having been seen in any of the hill-districts of Southern India can only be accounted for on the supposition that it follows the line of the east coast of the peninsula in migrating to Ceylon; but how it contrives to reach that island unobserved throughout its long route of migration is indeed a mystery!

Habits.—This little bird frequents forest, more particularly its edges, and also trees at the sides of paths cut through the jungle; it is likewise to be found about the rhododendrons and other stunted trees lining the streams which flow through the patnas and "plains" in the main range. It betrays its presence by a monosyllabic whistle, followed by a sharp little trill, recalling somewhat the note of the Wheatear. It is a restless species and active in its movements, quickly darting on its prey, on seizing which it will often glide to a prominent perch, such as a branch overhanging the road, or a stump in the coffee close to the pathway, and there giving out its lively whistle, will again dart off to another post of observation. Adult males are usually found alone, but not far from each other; and I have noticed that the young birds, of which numbers visit us, pass a solitary existence entirely away from the companionship of their fellows.

PASSERES.

Fam. SAXICOLIDÆ*.

Bill straight, compressed towards the tip. Nostrils oval or rounded and somewhat exposed; rictal bristles generally small, in some well developed. Wings variable—in some pointed, with the 1st quill much reduced; in others moderately rounded, with the 1st quill rather lengthened. Tail of twelve feathers. Tarsus lengthened, in some smooth, in others scutellated.

Of small size. Nesting on the ground or in holes or niches, and of *gesticulating habit with the wings and tail.*

Genus PRATINCOLA.

Bill wide at the base, the culmen moderately curved; gape beset with well-developed rictal bristles. Nostrils protected by a few impending bristles. Wings rather rounded, the secondaries long; 1st quill slightly less than the innermost secondary, the 3rd to the 6th nearly equal, the 4th being the longest. Tarsus smooth, exceeding the middle toe with its claw; lateral toes short.

PRATINCOLA BICOLOR†.

(THE HILL BUSH-CHAT.)

Pratincola bicolor, Sykes, P. Z. S. 1832, p. 92; Hume, Str. Feath. 1873, p. 183; id. Nests and Eggs (Rough Draft), ii. p. 314 (1874); Fairbank, Str. Feath. 1876, p. 406.

Pratincola atrata (Kelaart), Blyth, J. A. S. B. 1837, xx. p. 177; Kelaart, Prodromus, p. 101, et Cat. B. p. 121 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 266; Jerdon, B. of Ind. ii. p. 124 (1863); Holdsworth, P. Z. S. 1872, p. 454.

Pratincola caprata, in pt. (Linn.), Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 284 (1854); Sharpe, Cat. B. iv. p. 195 (1879).

The Nilgherry Black Robin, Jerdon; *The Nuwara-Elliya Robin*, Europeans in Ceylon.

Adult male. Length 5·9 to 6·2 inches; wing 3·0 to 3·25; tail 2·25 to 2·4; tarsus 0·9; middle toe, with its claw, 0·85 to 0·9; bill to gape 0·8 to 0·82.

Iris hazel-brown; bill, legs, and feet black.

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* In this *family* I have placed together the Ceylonese members of that large and interesting group of birds which are normally of small size, and possess that peculiar spasmodic habit of the wings and tail which is highly characteristic of their typical representatives, the true Chats, and which, combined with their non-sylvan habits, tend to form a bond of unity, in spite of perplexing external differences, such as a smooth and a scaled tarsus, or a bare and a bristled gape. Many of them possess Muscicapine affinities, and not a few Turdine; and it therefore appears to me that the family forms a well-marked connecting-link between the Flycatchers and the true Thrushes.

The *Saxicolinæ* are placed by Jerdon among the Sylviidæ; but I shall reserve for this family Warblers which possess certain well-marked characters of structure and economy, which have been lately pointed out by Mr. Seebohm.

† The North-Indian race *P. caprata* is said by Layard to have been procured at Ambegamoa, a hill-district; it is, however, a resident species in northern parts, and does not migrate southwards, so that, probably, specimens of the present species were mistaken for it

Above and beneath coal-black, slightly brownish on the lower part of the breast; tips of the rump-feathers, and all but the terminal portions of the tail-coverts, the median and innermost feathers of the greater wing-coverts, together with the centre of the abdomen and the under tail-coverts, white. Not unfrequently one or two white feathers about the nape exist, and the amount of this colour on the rump and lower parts varies somewhat.

Female. Length 5·6 to 5·9 inches; wing 2·9 to 3·05; bill, legs, and feet not so black as in the male.

Above, with the throat and neck dusky brown, the feathers edged brownish fulvous; wing-coverts with broad margins of the same; rump and upper tail-coverts pale rufous, the under coverts slightly lighter, and the lower breast and abdomen brownish fulvous, slightly albescent about the centre of the abdominal region.

Young. The nestling male is blackish brown above, with mesial fulvous spots to the clothing-feathers and broad margins to the wing-coverts and quills; throat and fore neck fulvous, with black edgings, and the lower breast and abdomen pale fulvescent; rump, upper and under tail-coverts faded rufous.

When the black plumage is assumed it is edged with brown; the quills are blackish brown, and the white of the abdomen extends up to the lower breast; the white rump is also tinged with rufous-buff.

Obs. This singular form, in the matter of its spotted immature plumage and the bristles which arm the gape, makes a connecting-link between the Flycatchers and the Chats. Mr. Sharpe places it, along with the rest of the "Chats," among his Muscicapidæ, which comprise, in his 4th volume of the 'Catalogue of Birds,' an immense number of species having strong rictal bristles and exceedingly diverse habits. In this species the rictal bristles do not project beyond the nasal membrane; and I therefore deem it more expedient, in a local work like this, to keep it in its original position, reserving as Flycatchers only those species which, by reason of their habits, are entitled to the name. As an inhabitant of the hills of Ceylon and South India, and of constantly larger size than its widely-spread North-Indian, Malayan, and Philippine representative, *P. caprata*, it appears to be worthy of being considered a good subspecies or local race of the latter; were it a smaller bird than *P. caprata*, thus following the rule observable in nearly all species inhabiting both Ceylon and the mainland, the question of size would not entitle it to subspecific rank; but in its case this rule is exactly reversed, and we find it an inhabitant only of elevated regions, with larger proportions than are anywhere displayed by its northern *lowland* representative.

I have examined a large series of *P. caprata* in the British Museum with a view of ascertaining whether it ever attained to the size of the Ceylonese and Nilghiri race, and I find that males from Nepal, Behar, N.W. Himalayas, Saugor, Burmah, Macassar, Timor, Philippines, E. Java, Celebes, and Lombock vary in the wing from 2·6 to 2·9 inches, and females from 2·4 to 2·7; throughout the whole series examined the smallness of the bills was particularly noticeable, the average length, from tip to gape, being 0·62, and in only one specimen did it reach 0·7. The black of the upper surface and breast is more glossy and intense than in *P. bicolor*, and there is generally, more especially in Malayan specimens, more white on the rump.

Mr. Hume remarks that examples of *P. bicolor* from the Western Ghâts, the Nilghiris, Palanis, and other Southern-Indian ranges are absolutely identical with others from the hilly portions of Ceylon. He considers that Sykes's name was given to a Mahabaleshwar (Western Ghâts) specimen, in which case it would apply to our bird, which was subsequently described from Ceylon by Blyth under Kelaart's MS. name *atrata*. It is highly probable that Sykes's bird belonged to the larger race, as his measurements (P. Z. S. 1832, p. 92) are "longitudo corporis 5·8 unc., caudæ 2·4;" and these correspond with those of our race. Mr. Hume says that the Nilghiri birds "average in length 5·5 to 5·7; wing 3; tail from vent 2·0 to 2·2." I have examined several in the national collection, and though they equal Ceylonese examples in the wing, they are not so large in the bill.

Distribution.—The Hill-Chat is only an inhabitant of the upper mountains, and even there its limit is markedly defined. Commencing with the Horton Plains, to the lonely solitudes of which its sprightly little form lends a charm, it radiates over the Nuwara-Elliya plateau, being very numerous at the sanatarium itself, and extends through Kandapolla down to the Elephant Plains and the upper parts of Udu Pusselawa, where its numbers at once decrease, its occurrence even in Maturata being not at all frequent. On the Uva side it ranges through the patna-basin to Haputale, on the southern slopes of which, as well as on those of the adjacent high ridges above Haldamulla and Bilhuloya, it is found as low as 3500 feet. Beyond Badulla it is rare; and in the upper parts of the Knuckles I am not aware that it is located at all.

In Dimbulla and Dickoya it is almost replaced by the Black Robin (*Thamnobia fulicata*). I did not observe it at all in the former region, and I understand that it is not very common in either.

In the south of India it is found commonly on the Nilghiris and the adjacent high ranges. Dr. Fairbank procured it at Kodoikanal, at the top of the Palanis. From the Nilghiris northwards it extends along the Western Ghâts to their termination, I conclude, as it appears to be found at Mahabaleshwar, which is at an elevation of 4700 feet above the sea.

Habits.—The "Nuwara-Elliya Robin" frequents the "plains" or open downs of the main range, gardens round the sanatarium, patnas in Uva, and bare or rocky localities in the districts above mentioned. It is usually found in pairs, and is a sprightly bird in its actions, with all the habits, flight, and note of a true Chat. It is constantly flitting from bush to bush or rock to rock, or perching on stakes, fences, and such like; and while thus seated, raises and depresses its tail and darts out its wings in precisely the same manner as the Stonechat, and when so doing utters a quick Chat-like note. It is far from shy, flying only from bush to bush when pursued. In the early morning it is abroad almost before any other bird; and the male, perched on the top of a low bush, sends forth a sweet little warble, which, sounding out from the thick mists which at daybreak often envelop these lonely upland plains, falls on the ear of the traveller with an effect, perhaps, more pleasing than that produced by any other bird-sound which he hears in such elevated regions. In the evenings, shortly before sunset, these Chats display much restless activity, perching on elevated stones and rocks, and darting from one to another with much chirping and jerking of the tail and wings; and I have even noticed them sitting on the telegraph-wires between "Wilson's Bungalow" and Nuwara Elliya. Their food consists of insects and larvæ of various kinds, which they take chiefly on the ground, flying down suddenly at them from their perch, and after devouring them realighting on adjacent bushes. The small rhododendrons growing about Nuwara Elliya and on all the surrounding plains form a favourite perch for this bird.

Nidification.—The breeding-season of this species is during April, May, and June. I have not found the nest myself; but it is said to be placed in holes of banks or old walls, and mention is made, in 'Nests and Eggs,' of a pair that built in an old up-turned basket. The structure is described by Mr. Hume as "a large loose saucer-shaped pad, composed of grass and vegetable fibre;" this is mixed with "dead leaves, a little wool, or a piece or two of rag;" it appears to have little or no lining, and sometimes the egg-cavity is very slight. The number of eggs varies from three to five. In shape they are broad ovals, slightly pointed towards the small end; the ground-colour is delicate bluish green, thickly freckled, speckled, and streaked with brownish red; these markings sometimes form an ill-defined mottled cap at the large end, and a faint purple mottling often underlies the cap or zone. Dimensions from 0·72 to 0·82 by 0·53 to 0·63 inch.

The young leave the nest almost before they can fly; and I have found them hiding in the long grass on the Elephant Plains.

Genus COPSYCHUS.

Bill rather long, somewhat straight; culmen decurved from the middle, tip notched and well bent. Nostrils exposed, basal, oval, the membrane bordered by the nasal tufts; a few bristles at the edge of the lores. Wings with the 1st quill rather short, and the 2nd considerably shorter than the 3rd; the 4th and 5th the longest. Tail rather long, graduated and round. Tarsus smooth, longer than the middle toe and claw.

COPSYCHUS SAULARIS.

(THE MAGPIE ROBIN.)

Gracula saularis, Linn. Syst. Nat. i. p. 165 (1766).

Copsychus saularis, Blyth, Cat. B. Mus. A. S. B. p. 166 (1849); Kelaart, Prodromus, Cat. p. 120 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 263; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 275 (1854); Jerdon, B. of Ind. ii. p. 114 (1863); Blyth, Ibis, 1867, p. 11; Swinhoe, P. Z. S. 1871, p. 359; Holdsw. P. Z. S. 1872, p. 453; Walden, Ibis, 1873, p. 307; Hume, Nests and Eggs, ii. p. 303 (1874); id. Str. Feath. 1874, p. 230; Ball, *t. c.* p. 412; Hume, ibid. 1875, p. 133; Hume & Armstrong, ibid. 1876, p. 327; Hume, *t. c.* p. 458; Oates, ibid. 1877, p. 157; Butler, *t. c.* p. 322; Fairbank, *t. c.* p. 406.

Turdus saularis, Sykes, P. Z. S. 1832, p. 87.

Copsychus ceylonensis, Sclater, P. Z. S. 1861, p. 186; Legge, J. A. S. (Ceylon Branch) p. 44 (1870–71).

The Dial-bird, Latham; *Dyal-bird* in India; *Dayal* in Bengal; *Dayyur,* Hind. (Jerdon); *Thabeitgyee,* in Arracan; *Pedda nalanchi,* Telugu; *Sa-ka,* Siam.

Pollichcha, Sinhalese; *Pega,* Portuguese in Ceylon; *Karavi-kuruvi,* lit. "Charcoal-bird," Tamuls in Ceylon, also *Manathee* in Jaffna district (Layard).

Adult male. Length 8·0 to 8·5 inches; wing 4·0 to 4·1; tail 3·5; tarsus 1·15 to 1·2; mid toe and claw 1·0; bill to gape 1·15.

Iris dark brown; eyelid neutral brown; bill black; legs and feet plumbeous brown or blackish leaden, claws black.

Head, neck, chest, and upper surface with the scapulars glossy blue-black; quills and tail black; secondary wing-coverts, outer webs of tertials, under surface from the chest, under wing-coverts, three outer tail-feathers entirely and the next pair, except on the inner margin, pure white; thighs white, black posteriorly. The white wing-coverts and outer webs of the tertials form a broad longitudinal band on the wing when closed.

Female. Length 7·8 to 8·2 inches; wing 3·8. Bill not so deep a black, and paling slightly at the base; legs and feet neutral brown.

Above blue-black, but pervaded with a greyish hue about the hind neck, and blending on the sides of the neck into the slate-colour of the throat, fore neck, and chest; the white of the wings, underparts, and external tail-feathers as in the male; posterior part of thighs blackish.

Young male. Bill blackish brown; legs and feet dark plumbeous. Head and back brownish black, the feathers of the rump edged rufous-brown; wings blackish, the feathers edged with rufous; the margins of the outer primaries paler than the rest, least and median wing-coverts with terminal rufescent spots; throat greyish white, the cheek-feathers tipped with fulvous; the lower neck and chest ochraceous, the feathers with dark edges, and those at the lower part next the white breast dark slaty; the white feathers of the breast finely edged with slaty.

This is a description of a single example; but the young vary somewhat in the extent and depth of the fulvous markings; *females* are slaty on the hind neck and back, and they have the chest paler.

Obs. The females of this species in Ceylon have, as a rule, the back of a darker shade than those from North India; hence the separation by Dr. Sclater of the Ceylonese from the continental race. Examples from South India, however, correspond in this respect with ours; and I have examined a Kattiawar example quite as pale as any Ceylonese one. The pale back is a character which increases as this species ranges northwards, where it exists also in the male bird. The white of the outer tail-feathers varies with age. In very old birds from Ceylon there is, as far as I have examined them, always a certain amount of black at the inner edge of the fourth feather from the side, but it varies sometimes in the same individual as regards the two sides of the tail; for instance, a specimen before me has this feather on one side with a black inner margin near the base, on the other with a broad

black margin all along and the outer edge as well black. In specimens not fully aged there is a good deal of black on this feather, though not so much apparently as in those from the eastern side of the Bay of Bengal, where this nigrescent character seems to increase. Mr. Hume remarks that Thayetmyo birds have more black "on the fourth feather than is usually seen in typical *saularis*." In the Andamans the black augments still more, although specimens there vary *inter se*. The same writer remarks that "the third pair always have a certain amount of dusky on the inner margin, and the fourth has so much black that the white is reduced to a triangle, whose base is at the tip." Lord Tweeddale speaks of specimens with the fourth pair almost entirely black. This character, therefore, is not one on which any dependence can be placed; and I mention this, as the contrary idea has obtained with some writers. The Andaman bird has, however, the flanks tinged with rufescent, and may, perhaps, be distinct, in which case it stands as *C. andamanensis*, Hume. The Malaccan, Javan, and Sumatran birds belong to a different species, *C. musicus*, Raffles, differing, as Lord Tweeddale shows (Ibis, 1876, p. 309), in having the under wing-coverts white, centred with black, and the three pairs of outer tail-feathers only white, the fourth pair being black. A third species is that from the Philippines (*C. mindanensis*), which has the under wing-coverts all black, and the tail the same.

As regards the relative size of Ceylonese and continental birds, I find that a Travancore male example measures 3·8, one from Behar 3·85, and two from Nepal 4·0 inches respectively in the wing; the three outer tail-feathers in all are wholly white, and the fourth has a black inner edge as in insular specimens.

Distribution.—The Magpie Robin is universally distributed throughout the whole island up to an altitude of 5500 feet; there is no spot in the low country, save the solitudes of the damp southern and western forests, where it may not from time to time be observed; for it is as much at home in the unfrequented groves of the Park country, or along the lonely tracks through the eastern jungles, as it is in the gardens of Colombo. I found it scarcer in the scrubs of the south-east than in any other part of the low country; for, though it is very common between Batticaloa and Madulsima, and also in barren country from that part to Trincomalie, it does not seem to accommodate itself to the similar climate and vegetation of the Kattregama plains. In Dumbara and in other coffee-districts of medium altitude on the Kandy side it is a common bird, and throughout Uva, including the Elephant Plains and upper parts of Udu Pusselawa, it is not unfrequent; but it does not, I believe, range so high on the western side of the Nuwara-Elliya plateau. It is likewise a scarce bird in the higher parts of Morowak Korale, which district has a colder and damper climate than the same altitude in the Kandy country. It is very common in the Jaffna peninsula.

The Dayal is spread throughout India, becoming scarcer towards the north-west, but not diminishing in numbers in the north-east sub-Himalayan region, Cachar, Burmah, and Tenasserim. In the Andamans it is likewise common. Mr. Davison remarks that it is abundant all about Port Blair. Eastward of the kingdom of Burmah it extends into Siam and China. Of its range in the latter country Swinhoe says, "Southern China, westwards to Szechuen, and in Hainan." Returning to India to take a more complete view of its localization, we find it to be very common in the lowlands of the Madras Presidency, occurring, of course, in the intermediate island of Ramisserum. In the Palanis it is found from the base up to about 5000 feet, a similar condition to that in Ceylon; but it is not noticed by Mr. Bourdillon in the more western hills of Travancore; here, however, it has most likely been overlooked. In the Deccan it is said to be rare (Fairbank, Str. Feath. 1876, p. 259), but common along the hills. It occurs throughout Chota Nagpur, and is common northwards from that to the base of the Himalayas. At Murree it breeds, says Capt. Marshall; and between Mussoori and Gangaotri it is seen at moderate elevations (*Brooks*). Further west, Mr. Hume remarks that the climate is too arid for it in the regions bordering Sindh; it is not common about Mount Aboo and on the adjacent plains, and the same is true of the Sambhur district; it is, however, found in Kattiawar; and Captain Butler has noticed it near Kurrachee in Sindh. From all this district, however, it departs, according to the latter writer, in April, some few pairs, perhaps, remaining to breed.

Habits.—This handsome showy bird is a universal favourite in Ceylon, frequenting alike the gardens and compounds of the poor, and the grounds and lawns of the rich, in both of which its attractive black and white plumage and its lively interesting habits combine to render it a pleasing ornament to the verdant face of tropical nature. It does not, however, restrict itself to the society of man, for it is found in all open cultivated lands, as well as sparsely-timbered forest, in the scrubby wastes of the northern and eastern parts, and the grassy wilds of the "Park" country. Its chief attraction lies in its lively actions, and the great amount of

animation displayed by the males; these consort together when not breeding, and meet continually towards evening in little troops, which perform a sort of tournament on the grassy swards; this consists in a series of prodigious hops towards and away from each other, accompanied by a jerking completely over the back of the tail, and a corresponding spasmodic down-strutting of the wings, which movements are enlivened with loud, cheerful whistles; at a given signal the meeting suddenly disperses, and darting off in opposite directions, all will alight on adjacent branches or roofs, except, perhaps, one, who appears, by common consent, to be left master of the field. These displays are said to be for the entertainment of some coveted female. I have at times observed one looking on, but just as often not; and I believe the habit to be merely an inherent one in all males. During the breeding-season, the cocks are very pugnacious, furiously assaulting any rival that may approach their nests.

The Dayal is very fond of locality, taking up its abode in particular spots, and there remaining throughout life, breeding and rearing its young. Its song in Ceylon is considered, and justly so, one of the finest of any bird in the island; its notes are most varied and very sweet, and are all the more attractive from the late and early hours which this pretty songster keeps. Its clear voice is heard the first thing in the morning and the last at night, sometimes from the green lawn in front of the bungalow verandah, and as often from the top of a *Casuarina* or cotton-tree overshadowing the roof; its powers of imitation are considerable, tempting it to mock the voice of fowls and other birds in the vicinity of its domicile. In the breeding-season so continued is its song that it will mount to the top of a tree and warble forth its love-notes in a pour of rain. Layard relates the following anecdote, which serves to illustrate its elocutionary powers:—"On the top of a towering cotton-tree, opposite my last residence in Colombo, a Magpie Robin daily for some weeks charmed me with his song, whilst his mate sat brooding her eggs or callow nestlings in the roof of a native hut beneath him. One morning, after the young had left their cradle and betaken themselves to the neighbouring compounds, I was attracted by cries of distress from various birds and squirrels, and above all I heard the seemingly plaintive mewing of a cat. I had no *living* specimen of the last in my museum, so wondering what could be the matter, went into the garden to see. I found the mewing proceeded from my friends the Robins, who were furiously attacking something in a bush, whilst the birds and squirrels screamed in concert. There I found one of the young robins . . . . . caught, as I thought, in the tendrils of a creeper. I put out my hand to release it, when, to my surprise, I saw the glittering eyes of the green whip-snake (*Trimesurus viridis*), in whose fangs the bird was struggling. I seized the reptile by the neck and rescued the bird, but too late; it lay panting in my hand for a few moments, then fluttered and died. On skinning it I found no wound, except on the outer joint of the wing by which it had been seized, and am confident that fear alone deprived it of life."

In India its pugnacious disposition assists the bird-catchers in capturing it. Hodgson, in writing on this subject, says that the professional bird-keeper, availing himself of the propensity the male birds have of calling each other in the breeding-season, "takes out his tame male on his fist, and proceeds to the nearest grove or garden; the bird at his bidding presently challenges, and a desperate contest ensues between the two, during which the fowler readily secures the wild bird with the tame one's assistance; for the latter will deliberately aid his owner's purpose, seizing the wild bird at the critical moment with both claws and bill, and retaining it until his master comes up, in case it has not been so exhausted by the previous contest as to be disabled from flying away at the man's approach. Fighting the tame birds is a favourite amusement of the rich; nor can any race of game-cocks contend with more energy and resolution than do these birds."

The diet of this Robin consists of insects of all sorts; but when tame it will come into verandahs of bungalows and pick up crumbs or any thing that may be thrown out to it.

Nidification.—In the west and south of Ceylon this Robin breeds between the months of February and July, having apparently more than one brood in the season. In the north it nests as early as November, and continues breeding throughout the north-east monsoon. In towns and about houses the nest is placed in holes in walls, under roofs, in decaying cocoanut- or jack-trees, and in the jungle in stumps and hollow trees, &c. The nest is usually an ample, shallow, loosely made cup of grass, dry roots, and fine twigs, measuring about 3 inches in diameter; sometimes, however, when placed in a niche in an old wall, it is a flat, pad-shaped structure, and is often lined with hair, pieces of rag, cotton, or other substance gathered about human habitations. A nest I found, built in the ordinary plaited cocoanut-leaf basket, used by the natives to protect their

ripening plaintains, was a shapeless structure of grass and dried weeds. The eggs are from two to four in number, and are broad short ovals in shape, of a pale bluish-green or very light greenish ground-colour, profusely speckled and blotched throughout, but most thickly at the large end, with bluish grey and two shades of umber-brown, with a few blackish blots and occasionally short streaks of deep sepia at the latter part. Some eggs are freckled uniformly all over with light brown, and others are very sparingly spotted. They measure from 0·91 to 0·96 inch in length, and from 0·65 to 0·75 in breadth. In Burmah, Mr. Oates writes, "This bird almost invariably selects a large hollow bamboo, many of which are generally to be found lying about the verandahs and cucumber-framings of the native houses, and places its nest about 2 feet inside the entrance."

Genus CITTOCINCLA.

Bill slenderer and more compressed than in *Copsychus*. Tail with the central feathers elongated and the laterals much graduated. Legs and feet somewhat slenderer than in *Copsychus*.

CITTOCINCLA MACRURA.

(THE LONG-TAILED ROBIN.)

Turdus macrourus, Gm. Syst. Nat. i. p. 820 (1788).

Kittacincla macroura, Gould, P. Z. S. 1836, p. 7; Blyth, Cat. B. Mus. A. S. B. p. 165 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 279 (1854); Jerdon, B. of Ind. ii. p. 116 (1863); Holdsw. P. Z. S. 1872, p. 453; Legge, Ibis, 1874, p. 21.

Copsychus macrourus, Hodgson, Cat. B. Nepal, p. 67 (1844); Kelaart, Prodromus, Cat. p. 121 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 264.

Cercotrichas macrourus, Hume, Nests and Eggs, ii. p. 306 (1874); Ball, Str. Feath. 1874, p. 412; Hume, ibid. 1875, p. 134; Ball, *t. c.* p. 293; Oates, ibid. 1877, p. 157; Hume & Davison, B. of Tenass., Str. Feath. 1878, p. 333.

Cittocincla macrura, Legge, Ibis, 1875, p. 396.

The Long-tailed Thrush, Latham; *The Indian Nightingale*, Jerdon; *The Sháma* (from its native name), Europeans generally in India and Ceylon; *Burmese Nightingale*, Davison; *Sháma*, in Bengal; *Abbeka*, Hind.; *Murabuta*, Malay; *Changchooi*, Sumatra.

Wal-pollichcha, Sinhalese.

Adult male. Length 10·5 to 11·3 inches (the centre tail-feathers varying much); wing 3·7 to 3·85; tail 6·5 to 7·0, centre tail-feathers exceeding the next pair by 1·75 to 2·2; tarsus 1·0 to 1·1; mid toe and claw 0·85 to 0·9; bill to gape 0·95 to 1·0.

The measurements of the tail-feathers are those of perfectly-plumaged birds.

Female. Wing 3·5 inches; centre tail-feathers shorter than in the male.

Iris brown; bill black; legs and feet fleshy, with a brownish wash on the toes; claws blackish.

Head, neck, back, wing-coverts, throat, and chest glossy blue-black; tail coal-black; wings brownish black; rump, upper tail-coverts, and terminal $1\frac{1}{2}$ inch of the four outer tail-feathers on each side white; beneath, from the chest, including under tail-coverts, light ferruginous; under wing-coverts paler than the breast; thighs white above, changing to black at the knee.

In some examples the 5th tail-feather from the exterior has some white at the tip.

Young. Iris brown; bill blackish, pale at the base beneath; legs and feet fleshy. The nestling has the head, back, sides of neck, and wing-coverts dark brown, with fulvous centres to the feathers of the body, and roundish terminal spots of the same on the wing-coverts; rump white, crossed by a brownish band; upper tail-coverts mixed black and fulvous: quills edged yellowish fulvous; throat and upper breast fulvous tawny, the upper parts with blackish-brown edgings.

Obs. As will be observed, the tail-feathers in Ceylonese examples of this species vary considerably in length, old or fully matured birds having them, no doubt, the longest. This same variation occurs in Indian specimens. Mr. Oates gives the dimensions of males from Thayetmyo as—length 10·35 to 10·8, wing 3·7, tail from vent 5·9 to 6·2; and of females—length 9·25, wing 3·65, tail from vent 5·0. These measurements are somewhat smaller than those of our birds. In Tenasserim its measurements, as recorded by Mr. Hume, are:—Males 11·0 to 11·75, tail from vent 6·5 to 7·2, wing 3·65 to 3·9; females—length 8·12 to 8·5, tail from vent 4·0 to 4·35, wing 3·25 to 3·4. I find a Nepal specimen with the breast very deep chestnut (wing 3·7, tail 6·4); a Travancore example is similar to it, and a Tenasserim and Malaccan (wing 3·5, tail 6·8, and wing 3·75, tail 6·5, respectively) very pale in that part. Two skins from Travancore are very long in the tail, measuring 7·3 and 7·5, and have a good deal of black at the base of the three lateral feathers.

C. suavis, Sclater, from Borneo is a very closely allied Malaccan race of this species, differing in the coloration of the outer tail-feathers, which want the black bases. In one or two specimens, however, which I have examined there *is* a

trace of the black, which demonstrates that this is merely a local race, and somewhat uncertain in its distinctive character.

Distribution.—In the west of the island the Sháma is very common from the Maha and Deduru oyas northward, and throughout the whole of the low country to the east and south-east of the hill-zone. Its charming notes are everywhere to be heard in the forests round Trincomalie, and it is nowhere more plentiful than on the Fort-Ostenburgh hills. In the jungles of the south-west it is much less common; but is, notwithstanding, found close to Galle; the same may be said of the Western Province generally, in which part it is chiefly located in the ranges stretching from the Three and Four Korales northward to Kurunegala; but here it frequents the densest underwood in the forests and impenetrable bamboo-jungle, and thus almost entirely escapes notice. From the low country it ranges through the sub-alpine forests to an altitude of about 3500 feet, being tolerably common in Dumbara, Hewahette, Maturata, and Uva generally, affecting chiefly the patna-woods which line the many streams and rivulets flowing into the tributaries of the Mahawelliganga. In the latter district and in Haputale it is found up to 4000 feet elevation. Layard first met with it in Lady Horton's walk at Kandy.

Of the distribution of the "Nightingale" in India, Jerdon writes:—"It is common in all Malabar, especially in the upland districts, as in the Wynaad, more rare in the Eastern Ghâts, and not unfrequent in all the jungles of Central India to Midnapore and Cuttock. It also frequents all the sub-Himalayan forests, and extends to the hill-tracts of Assam, Sylhet, Burmah, and Malacca." Mr. Hume more clearly defines its northern range when he says it is a permanent resident of the warm and well-watered jungles of the "sub-Himalayan region as far west as the Ganges, Southern and Eastern Bengal, Assam, Cachar, and Burmah." In all these regions it is evidently local, occupying those districts only which are well covered with jungle. Referring to the observations of late writers in 'Stray Feathers,' we find that in the Palanis it is recorded from the eastern base of the range, and from the Travancore hills is not mentioned at all by Mr. Bourdillon; in Khandala it is said to inhabit the thick woods along the hills. From the jungles of Central India it extends through Chota Nagpur to Eastern Bengal and the base of the Himalayas; but Mr. Ball observes that it is extremely rare in the first-named locality, and occurs sparingly in the Rajmehal hills. It appears to be resident in this part of India, for Capt. Beavan records that it breeds in Manbhum. To the east of the Bay of Bengal it is more common than in the district last under consideration; in Cachar it appears, however, to be only a winter visitor. In Pegu it is, says Mr. Oates, very common on the hills, but in the more southern province of Tenasserim, though found throughout its wooded portions, does not ascend the hills; beyond this limit it extends through Malacca to the islands of Java and Sumatra. Its range, however, is continued equally far towards the east, for it is an inhabitant of China, Swinhoe (P. Z. S. 1871, p. 359) recording it from Hainan.

Habits.—This showy bird is perhaps the best songster in Ceylon, its fine notes acquiring for it, with those who have made its acquaintance in the forests, a reputation equal to that which it has obtained in India. It frequents thick jungle, underwood in forest, and bamboo-scrub in portions of the island where this tree grows; it passes its time near the ground, seldom mounting to any height, but perching on some low branch or stick, and there warbling forth its song. There is no doubt that in such localities as these the notes of the Sháma, swelling forth from the impenetrable thickets, while the bird is hidden from view, naturally tend to inspire the listener with a stronger idea of their perfection than they perhaps really deserve. Far be it from me to wish to detract from its merits as a songster; for though the power of its notes may perhaps be exaggerated, nevertheless their absence from the wilds of Ceylon would be much missed, by the naturalist at any rate. Among those who have descanted on its melodious voice, none, perhaps, have paid the Sháma a greater tribute of praise than Tickell. He writes, in the 'Journal of the Asiatic Society':—"In the mornings and evenings the notes are heard through the valleys, ceasing with twilight. The strains sweep with a gush of sweetness through the enchanting solitudes which this bird makes its favourite resort, at times when other birds are silent in rest; and in unison with the surrounding scenery, in which nature seems to have lavished every fantastic invention of beauty, the effect produced on the mind and ear can alone be appreciated by those who have witnessed the magnificence of a tropical forest." Besides the notes which make up its song, described again by Jerdon as "a most gushing melody, of great power," this bird has others of a most varied character, among them being

one resembling a low *churr*, followed by a spitting sound, generally uttered when it is disturbed in its sylvan haunts. It is very shy, flying away at the least sound of a cracking twig; but its retreat is but short, and on realighting it commences to sing immediately. It has a habit of uttering a singular clicking sound, jerking up its tail at the same time; and this is usually performed when it is disturbed or hears any sound in the forest to which it is not accustomed. Mr. Davison speaks of the male performing a similar sound, as he supposes, with its wings, while flying across any open space at sunset; it may be that this is similar to that which I refer to.

In India it is, of course, highly prized as a songster; but in Ceylon it is scarcely ever met with as a caged bird, as the natives are very indifferent bird-nesters, and seldom or never find its young. Concerning its habits when in confinement, Blyth writes, "It has a considerable propensity to imitation; and one in my own possession learned to give the crow of a cock to perfection, also the notes of the Koel, the chatter of a troop of Saat Bhyes (*Malacocercus canorus*), &c. Many thousands of these elegant birds are kept in Calcutta; and the universal absurd practice is to darken their cages by wrapping them with several folds of cloth, enough to stifle the luckless captives in this climate, though it must be confessed that they sing most vigorously while thus circumstanced, but certainly not more so than mine, which were exposed to the light and air. It is a practice of the rich natives to employ servants to carry about their Shámas and other birds; and the number which are thus borne about the streets of Calcutta is astonishing; the poor birds are shut out from all light and air, like Mahomedan ladies enjoying (!) their evening drive; but they (the birds) nevertheless sing forth most lustily and melodiously." I have found the diet of those shot in Ceylon to be entirely insectivorous, consisting of small beetles, ants, flies, &c. It lives in pairs, the female usually keeping at some little distance from her companion; and, from what I have observed, it appears to attach itself to one particular spot, for in the northern parts of Ceylon it may often be found frequenting the scorched-up wood bordering newly-burnt clearings, as if it were loath to be driven from the haunt which the flames had devastated; it is possible, however, that it may find an abundance of food in these localities, uninviting as they may seem to human eyes. In his notes relative to the discovery of this bird in the woods near Kandy, Layard graphically describes the magnificent aspect presented by the beautiful vale of Dumbara, as at early dawn the dense fog which had mantled it during the night was lifted by the gentle breeze, suddenly unfolding all the beauties of the rocky Mahawelliganga and its wooded banks.

Nidification.—I have never received any information concerning this bird's nesting in Ceylon; in the north the young are about in August and September, proving that it lays in June and July. Mr. Davison found its nest in Tenasserim. One situated on the road to Meeta Myo, at 4000 feet above the sea, was obtained in April; it was built in a hole in an old stump growing on the side of a mountain-torrent, and was made of dry leaves and twigs, the egg-cavity being lined with finer twigs. Another was situated in a deep hole in a stump, the cavity having been filled up by the bird for more than 12 inches; the materials were the same. Both these nests had contained three eggs. Mr. Hume describes them as "being moderately broad ovals, a good deal compressed towards the small end." They have a slight gloss, and are "dull greenish stone-colour, everywhere densely freckled with a rich almost raw-sienna brown, in amongst which dull purplish markings are, when the egg is closely looked into, found to be thickly intermingled." They vary from 0·87 to 0·9 inch in length, and from 0·6 to 0·62 in breadth.

Genus THAMNOBIA.

Bill moderate, slender, curved throughout, wide at the base, compressed towards the tip, which is not notched. Nostrils oval, apert; rictal bristles wanting. Wings rounded; the 1st quill short, the 2nd equal to the 8th, and the 4th and 5th the longest. Tail broad and rounded. Tarsus long, exceeding the middle toe and claw, and covered in front by well-defined but smooth scutæ; toes strong, with the claws moderately straight.

THAMNOBIA FULICATA.

(THE BLACK ROBIN.)

Motacilla fulicata, Linn. Syst. Nat. i. p. 336 (1766).

Sylvia fulicata, Lath. Hist. vii. pp. 111 (♂), 112 (♀) (1821).

Ixos fulicatus, Sykes, P. Z. S. 1832, p. 89.

Thamnobia fulicata, Jerdon, Cat. B. S. India, Madr. Journ. 1839, x. p. 264; Blyth, Cat. B. Mus. A. S. B. p. 165 (1849); Kelaart, Prodromus, Cat. p. 121 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 256; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 281 (1854); Jerdon, B. of Ind. ii. p. 121 (1863); Holdsw. P. Z. S. 1872, p. 454; Hume, Nests and Eggs, ii. p. 307 (1874); Legge, Ibis, 1874, p. 21, et 1875, p. 396; Davidson & Wender, Str. Feath. 1877, p. 83.

Rusty-vented Thrush and *Sooty Warbler*, Latham; *Sooty Warbler*, Kelaart; *Indian Robin*, Jerdon.

Kalchuri, Hind.; *Nalanchi*, Telugu; *Wannati-kurari*, Tamul, lit. "Washerman's bird" (Jerdon).

Kalu-pollichcha, Sinhalese; *Kari-kuruvi*, Tamil, lit. "Blackbird."

Adult male. Length 6·2 to 6·4 inches; wing 3·0; tail 2·5; tarsus 1·0; mid toe and claw 0·8; bill to gape 0·7.

Iris brown; bill, legs, and feet black.

Entire body, except the abdomen, glossy blue-black, this, with the under tail-coverts, is fine chestnut; wings and tail coal-black; a large patch on the wing, formed by the lesser and median coverts, white.

Female. Length 6·2 inches; wing 2·8.

Bill and legs not so black as those of the male.

Above blackish brown, with a brownish hue caused by the palish margins of the feathers; quills slightly paler than back; secondary coverts edged with greyish; upper tail-coverts and tail black; beneath slaty black, under tail-coverts and tips of the abdominal feathers dark chestnut.

Young. Blackish brown; upper tail-coverts and tail black; beneath dark brown, with a dusky fulvous stripe down the throat, the feathers of the head and fore neck faintly tipped with rufescent greyish; ear-coverts striped with fulvous; under tail-coverts rufous.

Obs. This singular form is a difficult bird to deal with; its peculiar shaped bill and wings, its smooth gape and scutellated tarsus show it to possess Timaline affinities; and yet it has not in any way the habits of a Babbler, but is thoroughly Saxicoline in its economy.

Ceylonese specimens correspond in size with those from South India: males in the British Museum and in my own collection measure from 2·8 to 2·95 inches in the wing; a female is somewhat browner above, with a more sandy

hue on the head, throat, and chest than in most insular specimens of this sex. It is replaced in North India by the "Brown-backed Robin;" and between the two forms there are in Sindh, Guzerat, and Kattiawar, according to Mr. Hume, intermediate birds; he writes, "the backs of the males are much too dark for the one and not dark enough for the other." He further remarks that between the two types every possible intermediate link is to be found, and that it appears advisable to include both as local races of one species. Typical specimens of both forms, however, are very distinct from one another; and each appears to me to be a good *race* in itself, notwithstanding that the two extremes have a tendency, in particular districts, to unite. The females of *T. cambaiensis* are very distinct; they have the under surface uniform brownish grey, presenting the opposite character to that of the male; specimens of this sex from Nepal measure 2·6 to 2·7 inches in the wing.

Distribution.—The Black Robin is very numerous in the dry parts of Ceylon, and affects, by choice, the maritime districts of them, viz. from Chilaw northward to Jaffna and the adjacent islands, and thence down the whole east coast round to Tangalla on the south. In the Western Province and south-western districts it is less common, but is nevertheless in these parts a familiar bird, as it locates itself, to a great extent, in the vicinity of human habitations. As regards the latter part, I noted, in the 'Ibis,' 1874, that it was more numerous in the Galle district than "in the Western Province, appearing as if it increased gradually towards the south-east coast, where it is extremely abundant;" this seems, on further experience, to be the case. It inhabits the southern ranges and the lower hills of the Kandyan Province, and is found in coffee-districts of considerable altitude on the north and west of the main range, being not uncommon as high up as Maturata on one side and Lindula on the other. In the former neighbourhood its limit is abruptly defined by the high spur which culminates in the mountain of Mahacoondagalla, to the south of which it does not seem to pass, being immediately replaced on the Elephant Plains by the Hill Stonechat, *Pratincola bicolor*. It again reappears in Uva, extending from Badulla eastwards to Madulsima, and thence into the low country, in the interior of which, as well as to the south of Haputale, it is common. On the Dimbulla side I have seen it as high up as the Agra patnas, and about Lindula it is not uncommon.

In India this species is found, according to Jerdon, as far north as Taptee on the west and the Godaveri on the east, and is tolerably common in the south. It does not appear to frequent regions of any elevation, as it is not recorded from Travancore, and in the Palanis only from the eastern base. Dr. Fairbank says that it is found in the villages of the Deccan, as well as on the sides of all the hills. Messrs. Davidson and Wender likewise say that it is common in this region. To the north of this region it is replaced immediately by the species already noticed in the "observation." It inhabits the island of Ramisserum and the adjacent coast. I have lately acquired a specimen of *T. cambaiensis* from Mr. Whitely's collection, labelled Malabar; but I am of opinion that there has been a mistake in the locality.

Habits.—This familiar little bird is a general household favourite in Ceylon, frequenting the vicinity of human dwellings, perching on walls and roofs, and resorting even to the verandahs of bungalows. It seems to covet the companionship of man, taking up its abode in the very towns, and, as Layard remarks, frequents alike the Governor's palace and the native hut. I remember that a pair established themselves in an unused portable engine at the Colombo Breakwater Works, and dwelt fearlessly among the busy throng of workmen; in the evening, when the labours of the day were ended, they would roam about among the huge "beton" blocks and warble out their cheerful little notes, their tiny black forms contrasting strangely with the enormous white masses inanimately waiting their turn to be lowered into the deep. In the northern and eastern parts, where it is abundant, and likewise in many portions of the interior, it is by no means restricted, as Layard supposed, to the neighbourhood of houses, but is found in all open rocky places, in newly burnt clearings, and in cultivated cheenas; and in the Central Province it affects stony patnas and bare hill-sides. It is particularly fond of the low jungle, interspersed with "wood-apple" and other trees, which is characteristic of the east coast; and I have often enjoyed its companionship when sitting in the verandahs of huts and outhouses in that part and resting after the labours of the morning's collecting; it would come into the verandah and perhaps fly on to the arm of the long lounging-chair, or take up its position on the railing at the other end of the building, and give out its animated little call-note to its shier partner, who flitted from bush to bush in the adjacent compound. It is most animated in its movements, carrying its tail erect and jerking it up with a corresponding strutting down of its wings when giving out its pretty warble. It passes

much of its time on the ground, darting about after flies and insects, and moving hither and thither with a short jerky flight. It consorts in pairs; but the young brood remain a long time with their parents, thus forming after the breeding-season a little troop of three or four.

Jerdon writes as follows concerning this sprightly little bird :—"Its familiar habits well entitle it to the name of Indian Robin. It is usually found about villages, pagodas, old buildings, and mud walls, often perching on the roofs of houses and tops of walls, and feeding in verandahs, or occasionally even entering houses. It is, however, not confined to the vicinity of houses or villages, but is very common on rocky and stony hills, and in groves of palmyra or date-palms. It is generally seen singly or in pairs, and feeds on the ground, on which it hops with great agility, frequently pursuing and capturing several insects before it reseats itself on its perch either on a house or on a neighbouring tree or bush."

Nidification.—The "Black Robin" breeds during the months of March, April, May, and June in the Central, Western, and Southern Provinces, the majority of nests being built at the end of April. In the coffee-districts it often chooses the bank of one of the "zigzags," and builds in a niche in these exposed situations, heedless of the numbers of passers by. A hollow in the ground under the shelter of a rock or stone is another favourite spot; and not unfrequently the nest is constructed on the top of a low outhouse wall, or in the side or against the beam of a roof. It is loosely constructed, and varies in size according to the locality; those which are built in niches or holes are made so as to fill the cavity, and are constructed of dry roots and grass-stalks of various sizes, being lined with finer materials of the same sort. One which I found placed against the "wall plate" of the roof of an outhouse in the Southern Province had a foundation made of portions of a cooley's blanket, which the bird had literally made wool of, completely pulling it to pieces and placing it in layers beneath the other materials of the nest, which consisted of moss, hair, roots, and grass. Two is the normal number of eggs, but sometimes three are laid; the ground-colour is greenish white, and at the obtuse end they are spotted thickly with bluish and grey, mixed with several shades of brown, which sparsely extend over the whole surface; these markings are often confluent and form a zone or cap at the large end; but this feature is entirely wanting in other specimens. They vary in length from 0·82 to 0·87 inch, and in breadth from 0·6 to 0·62 inch. After preservation they fade to a white colour.

In the north Layard has found the nest in December. In India the principal months are March, April, and May. The same miscellaneous materials are sometimes found in Indian nests as in Ceylonese. Mr. Aitken mentions having found one in a thatched roof; but such an elevated position is unusual, and he rightly states that the bird does not build so high as the Magpie Robin.

Genus CYANECULA.

Bill straight, much compressed towards the tip, which is slightly notched. Nostrils exposed; rictal bristles few and small. Wings somewhat pointed; 1st quill slightly exceeding the primary-coverts; 3rd and 4th the longest; 2nd equal to the 6th. Tail shorter than the wings and even at the tip. Tarsus long and smooth. Toes rather short and weak.

CYANECULA SUECICA.

(THE RED-SPOTTED BLUETHROAT.)

Motacilla suecica, Linn. Syst. Nat. i. p. 336 (1766).

Cyanecula suecica (L.), Brehm, Vög. Deutschl. p. 350 (1831); Blyth, Cat. B. Mus. A. S. B. p. 167 (1849); Layard & Kelaart, Cat. B. Prodromus, App. p. 57 (1853); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 267; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 311 (1854); Jerdon, B. of Ind. ii. p. 152 (1863); Blyth, Ibis, 1867, p. 17; Holdsw. P. Z. S. 1872, p. 454; Shelley, B. of Egypt, p. 85 (1872); Dresser, B. of Europe, pt. 26 (1874); Seebohm & Harvie Brown, Ibis, 1876, p. 125; Scully, Str. Feath. 1876, p. 145.

Cyanecula cærulecula (Pall.), Hume, Str. Feath. 1873, p. 190.

The Bluethroat, *Blue-throated Warbler* of some; *The Blue-necked Warbler*, Lath.; *The Swedish Nightingale*, in Sweden. *Hussenipidda*, Hind.; *Gunpigera* and *Gurpedra*, Beng.; *Dumbak*, Sindh; *Chaghchi*, Turki (Scully).

Adult male. Length (from skin) 5·4 inches; wing 2·9 to 3·1; tail 2·5 to 2·6; tarsus 0·95 to 1·05; middle toe and claw 0·8; bill to gape 0·65.

"Iris dark brown; bill black, interior of mouth yellow; legs and feet black and brownish black; claws black" (*Scully*).

Above, with the wings earth-brown, pervaded slightly with greyish on the hind neck, and inclining to ochraceous brown on the rump; primaries edged pale; the longer upper tail-coverts darker brown than the back; the central tail-feathers and the terminal third of the rest blackish brown; the remaining portion of them and the middle tail-coverts rufous.

A broad buff supercilium, extending from the nostril to the ear-coverts; lores blackish; ear-coverts tawny; chin, upper part of throat, its sides, and the lower part of the fore neck glistening lazuline blue, in the centre of which is a large rufous patch; beneath the blue of the fore neck is a black band, succeeded by another and a broader one of rufous; remainder of under surface dull white; under wing-coverts pale rufescent.

The depth of the rufous colour and the extent of the black and rufous pectoral bands depend on age. Specimens which show signs of immaturity in the presence of rufescent tippings to the wing-coverts have the throat-spot and the rufous pectoral band much paler than fully-matured birds.

Female. Wing 2·9 inches; tarsus 0·9.

Bill pale at the base; legs pale brown, feet blackish brown.

Above similar to the male, but with the forehead and crown darker, the centres of the feathers being blackish brown; a broad supercilium and almost the entire loral space whitish; throat and fore neck white, like the lower parts: the sides of the fore neck and a zone connected with them across the chest blackish, on each side of which the feathers are often tinged with rufescent and mingled with a few blue ones.

In this species the females, probably those which are barren, occasionally assume the plumage of the male. Such an example, in course of change, obtained in Heligoland by my friend Mr. Seebohm, has a white throat-patch, with the lower part of it rufous, on each side of it is a black patch; there is a blue zone across the chest, which shades gradually into the blackish band.

Young (Yenesay, Siberia, August, in Mus. Seebohm). Head, back, wing-coverts, throat, and chest blackish brown; the feathers on the upper parts, sides of the throat, and chest with broad fulvous striæ; the chin and down the centre of the throat fulvous; wings blackish brown, the primaries and secondaries edged with rufescent; tail the same, upper tail-coverts dusky rufous; tail with the black terminal portions slightly deeper than in the adult, the rufous bases the same in colour; belly dusky whitish, the feathers tipped with blackish, which gradually increases up to the chest; under tail-coverts pale rufescent.

After the autumn moult the nestling acquires a certain amount of blue on the throat. A Heligoland example killed in May, which would be about ten or eleven months old, has a blue gorge, mingled with buff spottings, a small rufous spot on the throat, immediately succeeded by the black zone, the feathers of which are tipped with white; at the next moult the blue colour spreads, and the rufous, as already mentioned, deepens and becomes pure.

Obs. The White-spotted Bluethroat (*C. leucocyanea*), which is generally admitted now to be a distinct race, has, as its name implies, the spot of the throat satiny white. The present species, however, exhibits a tendency to assume the white throat in some localities, although in other parts, such as Scandinavia, it never does; while there are likewise certain regions (Holland and N. Germany) in the habitat of the other race where it is known always to possess the white throat. Captain Shelley, writing in his 'Birds of Egypt' of *C. suecica*, says they differ considerably in the colour of the throat-spot, "which may be met with in all stages from pure white to rufous." Dr. Altum relates an instance, in 'Naumannia' for 1855, of a young bird, which turned out to be a true *C. leucocyanea*, assuming a red throat-spot for a few days during the time that this was turning from greyish white to pure white; from which combined testimony we gather that each race occasionally assumes in the throat-spot the colour of the other, but that they put on their true dress in the breeding-season in the localities to which they resort to rear their young. Mr. Hume remarks that the white-spotted race is *rarely* found in India. Specimens so identified may have been perhaps *C. suecica*. A third race exists in Germany, Holland, and Spain, in which the throat is unspotted blue. It is rare, and is the *C. wolfi* of Brehm.

Distribution.—The interesting fact that at certain periods of their existence birds are possessed of the instinct of migration to a greater degree than at others, and consequently are induced at times to overstep the ordinary limits of their annual journeys, is demonstrated in more than one instance in the history of Ceylon ornithology.

The case of the present species is one of the most interesting which I have to deal with in this work. It takes its place in our lists as a *migratory* straggler on the evidence of Layard, who procured "a few specimens in the month of March at Ambegamoa;" one of these is still extant in the Poole collection, and is the only example I have ever seen from Ceylon. I am under the impression that a bird I met with in a thicket, while traversing some jungle on the slopes of the Dolookanda mountain in the Seven Korales, was this species; but I was unable to verify my identification, either by shooting it or sufficiently observing it as it darted into the underwood in the shade of the thick jungle. On some future occasion it will doubtless be procured again in Ceylon; for its visits are, perhaps, of more frequent occurrence than has been supposed.

It is a cool-weather visitant to India, spreading more or less throughout the country; but it does not appear to be often found in the extreme south, neither Dr. Fairbank nor Mr. Bourdillon having procured it. Jerdon remarks that it is found in "suitable localities," from which I gather that there are many districts in which it is not usually met with. It extends as far east as Burmah, having been procured by Wardlaw Ramsay on the Pegu plain, and to the Andamans it is a regular annual visitor. It leaves the country for the north in March and April, and arrives in Turkestan, according to Dr. Scully, at the end of March, and leaves again in September. Its migration, however, is continued much further north than Turkestan; for Mr. Seebohm procured it in the valley of the Yenesay, and found it breeding as far up as latitude $66\frac{1}{2}°$ N. Dr. Finsch found it in July 1876 on the Chinese Altai and on the Irtisch, as also at Semipalatinsk; and Von Middendorff observed it breeding as far north as 70° N. It extends to the eastern parts of Siberia, and is found, according to Swinhoe, throughout China. From Western Asia and North-eastern Africa it migrates to Northern Russia and Scandinavia, breeding there in great numbers; and it occurs on passage in the spring in Heligoland. In Palestine it is, according to Canon Tristram, a winter visitant. Captain Shelley remarks that it is an extremely abundant species in the delta of the Nile, and that it is very generally distributed throughout Egypt. It does not arrive in Northern Russia until late in the spring, as Messrs. Seebohm and Harvie Brown did not observe the first migrants to the Lower-Petchora district until the 23rd May.

Habits.—This handsome Warbler, which is gifted with such fine notes that it is styled, in some countries, the Nightingale, frequents gardens and open country in India, and is, according to Jerdon, particularly partial to reeds and corn-fields. Its habits are in the highest degree interesting. I subjoin the following account of its vocal powers from Messrs. Seebohm and Harvie Brown's paper on the Birds of the Lower Petchora:—"Often were we puzzled by the mimicry of this fine songster. On one occasion, after listening for some time to the well-known musical cry of the Terek Sandpiper, blended with the songs of scores of other birds, on approaching we saw our little friend perched high in a willow-bush, with throat distended, bill rapidly vibrating, and uttering the *tirr-r-r-whui* with perfect distinctness. We have heard the Blue-throated Warbler also imitate, amongst other bird-voices, the trilling first notes of the Wood-Sandpiper, or the full rich song of the Redwing.

Sometimes he runs these together in such a way as to form a perfect medley of bird-music, defying one who is not watching to say whether or not the whole bird-population of that part of the forest are equally engaged in the concert at the same time." In this district it frequents underwood in the pine- and juniper-forests clothing the sides of the valleys and also the birch- and willow-thickets along the river-banks. Captain Shelley remarks that, "although it frequents reedy marshes and mustard-fields, or wherever the vegetation is luxuriant, it rarely alights upon the plants, but almost invariably keeps to the ground, where it runs with tail upraised, stopping every now and then to pick up an insect or to watch the intruder from the edge of its retreat." Its disinclination to perch, and normal terrestrial habit, which show its affinity to the rest of the Saxicolinæ, are likewise noted by Dr. Scully, who observed it in Yarkand, and who remarks that "it did not seem to perch, but moved about pretty rapidly on the ground, picking up insects, and every now and then spreading out its tail widely." The same writer says that its Turki name is given it on account of a sound which it is said to make, resembling the noise of the spinning-wheels used by the women of Yarkand. It feeds on insects, and while doing so, says Jerdon, sometimes jerks up its tail, but does not quiver it like the Redstarts.

Nidification.—In the neighbourhood of Yarkand, the Bluethroat breeds in May, the nest being, says Dr. Scully, placed usually in long grass. The eggs are described as "moderate ovals, compressed at one end, and with a very slight gloss; the ground-colour is pale greyish green, abundantly blotched and spotted with light greyish brown, the whole surface of the egg having these markings pretty widely distributed over it."

PASSERES.

Fam. TURDIDÆ.

Bill straight, compressed towards the tip, the culmen gently curved, and the tip more or less notched. Rictal bristles generally small. Wings with the 1st quill *markedly reduced.* Tail, shorter than the wings, of 12 feathers, except in one genus, in which the number varies from 12 to 14. Tarsus *smooth*, longer than the middle toe.

With a single annual moult.

Genus LARVIVORA.

Bill straight, compressed; culmen slanting from the base and curved at the tip only, which is obsoletely notched. Rictal bristles short and scanty. Nostrils exposed. Wing with the 1st quill much reduced, slightly exceeding the primary-coverts; the 4th longest, and the 2nd equal to the 6th. Tail short, about two thirds the length of the wing. Tarsus long and slender. smooth in front. Feet delicate; the middle toe much exceeding the lateral ones.

Of small size.

LARVIVORA BRUNNEA.

(THE INDIAN WOODCHAT.)

Larvivora brunnea, Hodgson, J. A. S. B. 1837, vi. p. 102 (female).

Larvivora cyana, Hodgson, *t. c.* p. 102 (male); Jerdon, B. of Ind. ii. p. 145 (1863); Holdsworth, P. Z. S. 1872, p. 454; Hume, Nests and Eggs, ii. p. 324 (1874).

Calliope cyana (Hodgs.), Blyth, Cat. B. Mus. A. S. B. p. 169 (1849); Layard & Kelaart, Prodromus, Cat. B. App. p. 57 (1853); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 266.

Phœnicura superciliaris, Jerdon, Cat. B. S. India, Madr. Journ. 1844, xiii. p. 170.

Larvivora superciliaris (Jerdon), Blyth, Ibis, 1867, p. 16; Brooks, Str. Feath. 1875, p. 240; Fairbank, ibid. 1876, p. 259.

White-browed Redstart; *The Blue Larvivora*, Hodgson; *The Blue Wood-Chat* (Jerdon). *Manzhil-pho*, Lepchas. *Robin* of Planters in Ceylon.

Adult male and female. Length 5·3 to 5·6 inches; wing 2·9 to 3·1; tail 1·9 to 2·1; tarsus 1·0 to 1·1; mid toe and claw 0·8; bill to gape 0·75.

Male. Iris brown; bill blackish brown above, under mandible brown, pale at base and at gape; legs and feet delicate fleshy, claws concolorous.

Above, with the wing-coverts and tail dull blue; lores, cheeks, beneath the gape, and ear-coverts black, blending on the sides of the neck into the blue; a conspicuous white supercilium, and in some the chin and a thin bordering line below the cheeks white; wings blackish brown, the outer webs of the quills bluish, the margins of the outer primaries the palest; throat, chest, breast, and flanks fine orange-rufous; the under tail-coverts, vent, and abdomen white, blending into the surrounding colour; thighs bluish brown externally.

Female. Iris brown; bill not so dark as in male; legs and feet dusky fleshy.

Head, upper surface, and wing-coverts dark olivaceous brown, greenest on the back, and changing into a rusty colour on the upper tail-coverts; quills brown, the outer webs of the primaries, secondaries, and primary-coverts rusty brown, the longer primary somewhat pale at the edge; tail rusty olive-brown; an orbital fringe of fulvous; tips of the loral feathers dark, the bases being fulvous; ear-coverts concolorous with the head, but striped with fulvous; throat, chest, breast, and flanks rusty fulvous, paling to buff on the gorge and chin, and with the feathers of the fore neck more or less tipped with dusky; cheek-feathers tipped with olivaceous; abdomen, vent, and under tail-coverts pure white; under wing-coverts fulvescent.

Very old bird? Head, hind neck, and back a darker or less olivaceous brown than the above, with a bluish cast on the crown; the wing-coverts and the tips of the lower back-feathers, as well as the upper tail-coverts, dull bluish; quills and greater wing-coverts brown, edged with rusty; tail rusty brown; lores and orbital fringe as in the above; the under surface a much brighter rufous than in the mature female; some of the throat-feathers tipped with dusky.

This is a description of a presumed female (carbolized) which I received from Mr. Thwaites of Hakgala. I have little doubt as to its being a female, on account of the absence of the black lores and supercilium.

Young. Males in the first year are dull bluish above, with the *lores only* black surmounted by *a short white stripe* or spot; throat whitish; chest and breast as in female. With age the black extends over the cheeks and ear-coverts.

Females are olivaceous above, brownest on the head, and changing into rusty on the upper tail-coverts; wings and tail brown, more or less edged with rusty; lores pale, orbital fringe whitish; ear-coverts pale-shafted; chin and gorge whitish, tinged with the hue of the chest and flanks, which is olivaceous fulvous; lower parts as in the adult. Scarcely any two examples are alike; the younger the bird is the more olivaceous are the upper tints, and the more dusky the chest and sides of breast. In some there is a brownish wash across the chest, and the forehead is rusty.

Obs. This interesting genus appears to form a link between the Saxicoline birds and the true Thrushes. It only differs from *Turdus* in its small size, *slightly* straighter and less notched bill, and shorter tail. Its habits are essentially those of a forest-loving Thrush, resembling such in its mode of feeding and progression, its flight, and its style of song.

At the time that Hodgson named this bird *L. cyana*, he perhaps did not know that Pallas had already applied a term of *similar meaning* (*cyane*) to the Siberian and Chinese species, or he would not surely have employed a title which sounded so much like a previously bestowed one. It has been in vogue up to the present by Indian writers; but I propose here to discard it, as it is, in my opinion, inexpedient to use a specific name of similar sense to, and only differing in its terminal letter from, an already existing one; and I will take the opportunity of mentioning that Mr. Sharpe approves of my decision. The specific name, it is true, is not very applicable to the male bird of the present species; but there are, I think, precedents for such a departure from strictly applicable nomenclature. Mr. Swinhoe procured the true *L. cyane* in China, and named it *L. gracilis* ('Ibis,' 1861, p. 262), as Mr. Blyth, to whom he sent his specimen, pronounced it to be distinct from Hodgson's bird; and it was not until four years later that he recognized in Pallas's figure of *Lusciola cyane* (pl. x. 'Travels in Eastern Siberia') his Chinese bird.

The male of *Larvivora cyane* has the upper surface dark blue, the forehead and above the eye brighter than the head; wings and tail brown, edged with dull blue; chin, fore neck, and under surface pure white, separated from the blue of the head and hind neck by a broad black border, which starts from the lores, covering the cheeks, face, and ear-coverts, and descending the sides of the neck to the flanks. Length 4·6 inches, wing (in seven examples) varying from 2·8 to 3·0. An immature male (September) has the head and hind neck brown; back and rump dull blue; beneath whitish, washed with rufous-buff on the sides of the throat and chest; the cheeks barred with dusky grey: a female (May) is olive-brown; under surface whitish, washed with buff; the feathers of the sides of the throat and across the chest tipped with dusky grey; wing 2·75. These examples are in the "Swinhoe collection," forming part of Mr. Seebohm's museum. It is found in Tenasserim, as well as in China and Eastern Siberia.

Distribution.—This handsome Chat is a migrant to our hills, arriving in the island about the middle of October and departing again in April. Being a bird of weak flight its migration to the Kandyan Province takes place by a gradual movement through the jungle from the extreme north, where it first appears. There Layard procured specimens in October 1851, and in the same month in 1873 I obtained a male example in the jungles surrounding Trincomalie. It is chiefly located in the upper hills or main range, being very common in the Horton Plains and throughout all the Nuwara-Elliya district; lower down it is found in all the surrounding coffee-districts, including the Knuckles or trans-Kandyan hills as low as 3000 feet. In the eastern parts of Uva it is not common, the great expanse of patnas below the plateau and the deep valley of Badulla probably proving a barrier to its progress. In the southern hills I never met with it; but it was probably overlooked by me, as there is no reason to suppose that some individuals do not cross the Saffragam valley to the Morowak and Kolonna Korales. It is worthy of remark that it comes to us largely in the young stage; and I have likewise observed that females predominate.

Concerning its distribution in India, Jerdon remarks that it is found in the Himalayas from Cashmere to Sikhim, and in the cold weather extends in small numbers to the plains, for it is procured near Calcutta. It is also an inhabitant of the Nilghiris. He met with it in a mango-grove at Nellore in the month of March, at which time, as he suggests, it must have been migrating northwards. It appears to be resident in the Nilghiris, as it breeds there. Dr. Fairbank mentions it as being found in Mahabaleshwar, which has an altitude above the sea of 4700 feet, and on the Goa frontier; but he does not say at what season of the year he met with it.

Habits.—This retiring little bird is almost wholly terrestrial in its habits, dwelling in nilloo and other dense undergrowth of the hill-forests, and now and then coming out into hedges and thick cover in gardens which are in proximity to the jungle; it even then covets the shelter which its life in the forest normally affords it, only showing itself for a moment or two, and then retreating. It is often seen at the edge of a forest-path searching for insects; but it quickly disappears into the adjacent thickets on the least alarm. The Hakgala Gardens are suitable to its habits; here it finds a welcome shelter beneath the choice conifers and handsome shrubs with which the enclosure abounds, and searches for its food in the well-kept soil. It proceeds along the ground or over prostrate dead wood with quick hops, and darts actively about, alighting on low sticks

or branches when disturbed. It feeds after the manner of a Thrush, pecking quickly at insects on the ground or on rotten moss-covered timber; and such a great variety does it devour, that Hodgson applied to it its generic name of *Larvivora*. From pecking in the soil its bill is frequently coated with earth like that of a Thrush. It is usually of silent habit; but the male has a lively little song, composed of a few sibilant notes, which it suddenly warbles out from beneath the dense underwood in the forest. Hodgson remarks correctly that it perches freely, but is usually on the ground; and Jerdon states that it has a low chuckling note like that of certain Stonechats.

Nidification.—Little is known of the nesting of this Chat. Its home is probably in Cashmere and the Himalayas; but some remain in the south of India during the breeding-season, and rear their young in the Nilghiris. Mr. Davison, in writing to the author of 'Nests and Eggs,' alludes to two nests found in March and May respectively, the first of which was in a "hole in the trunk of a small tree about 5 feet from the ground, and was composed of moss mixed with dry leaves and twigs." This nest contained three young birds. An egg found in the latter nest was an elongated, slightly pyriform oval, with but little gloss, and the ground-colour of a pale greyish green, thickly mottled throughout and chiefly at the large end, where the markings were almost confluent, with pale brownish red. Dimensions 0·98 by 0·67 inch.

Genus TURDUS.

Bill moderately long and straight, compressed towards the tip. Rictal bristles feeble. Wings with the 1st or bastard primary equal to the primary-coverts, or slightly exceeding them; the 4th or 5th the longest, and the 2nd longer than the secondaries. Tail and tarsus typical in their characters.

TURDUS KINNISI.
(THE CEYLONESE BLACKBIRD.)

Merula kinnisi (Kelaart), Blyth, J. A. S. B. 1851, xx. p. 177; Kelaart, Prodromus, Cat. p. 122 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 270; Blyth, Ibis, 1867, p. 304; Holdsworth, P. Z. S. 1872, p. 446; Hume, Str. Feath. 1878, p. 35.
The Nuwara-Elliya Blackbird, Residents in Ceylon.

Adult male and female. Length 9·0 to 9·7 inches; wing 4·3 to 4·6; tail 3·5 to 3·8; tarsus 1·25 to 1·3; middle toe and claw 1·2 to 1·25; bill to gape 1·17 to 1·25. Females average smaller than males.

Obs. In this species the wing is slightly rounder, and the 1st primary is often more lengthened than in typical *Turdus.* I say "often," for it is a singular fact that this feather varies in length in this bird. In some examples, especially young ones, it considerably exceeds the primary-coverts, although it generally equals them only, and in several specimens that I have examined it is longer in one wing than in the other of the same bird! In view of the irregularity in the length of this feather I have not removed it from the genus *Turdus.*

Male. Iris pale brown; eyelid and bill orange-yellow; legs and feet paler yellow than the bill; claws yellowish horny.
Above slaty bluish black, darkest on the face and head, the feathers of the upper surface having bluish-grey margins everywhere but on those parts; quills and wing-coverts broadly margined with dark bluish slaty: tail black, more indistinctly edged with the same: beneath dingy black, the feathers edged paler than those of the back, and with a greyish hue slightly pervading the abdomen.

Female. Bill yellowish orange; eyelid yellow; legs and feet pale yellow. Above dark bluish slate, pervaded with brownish on the head, the margins of all the feathers black; outer webs of primaries and secondaries washed with brownish slaty; tail blackish brown, beneath slaty washed with earthy brown; the feathers of the abdomen sometimes with light shaft-streaks; under wing-coverts edged with earthy brown.

Young. In the nestling the iris is brown; bill black, tinged near the gape and at the base of the lower mandible with yellow, which colour gradually spreads with age: legs and feet brownish yellow. A young bird in Mr. Holdsworth's collection has the head and neck brownish, the ear-coverts and lores darker; the back has a more bluish tinge than in the adult; the wings and tail blackish brown, with dull slaty edgings: throat and chest fulvous, the feathers with dark tips, the breast slightly paler, without the dark tippings.
An immature female in the plumage of the latter end of the first year, which I shot in January 1877 on the Horton Plains, has the throat, fore neck, and breast, together with the sides of the neck, as also the forehead and a space above the eye, earthy brown; but the lores and face are coal-black; on the head and hind neck there is a fulvescent tinge, and the wing-coverts and flanks have the feathers tipped with a still more ochraceous hue. This plumage is mingled on the back and wings with the nigrescent feathers of the adult stage. The last remnant of the immature attire is usually found in the pale tippings of the wing-coverts.

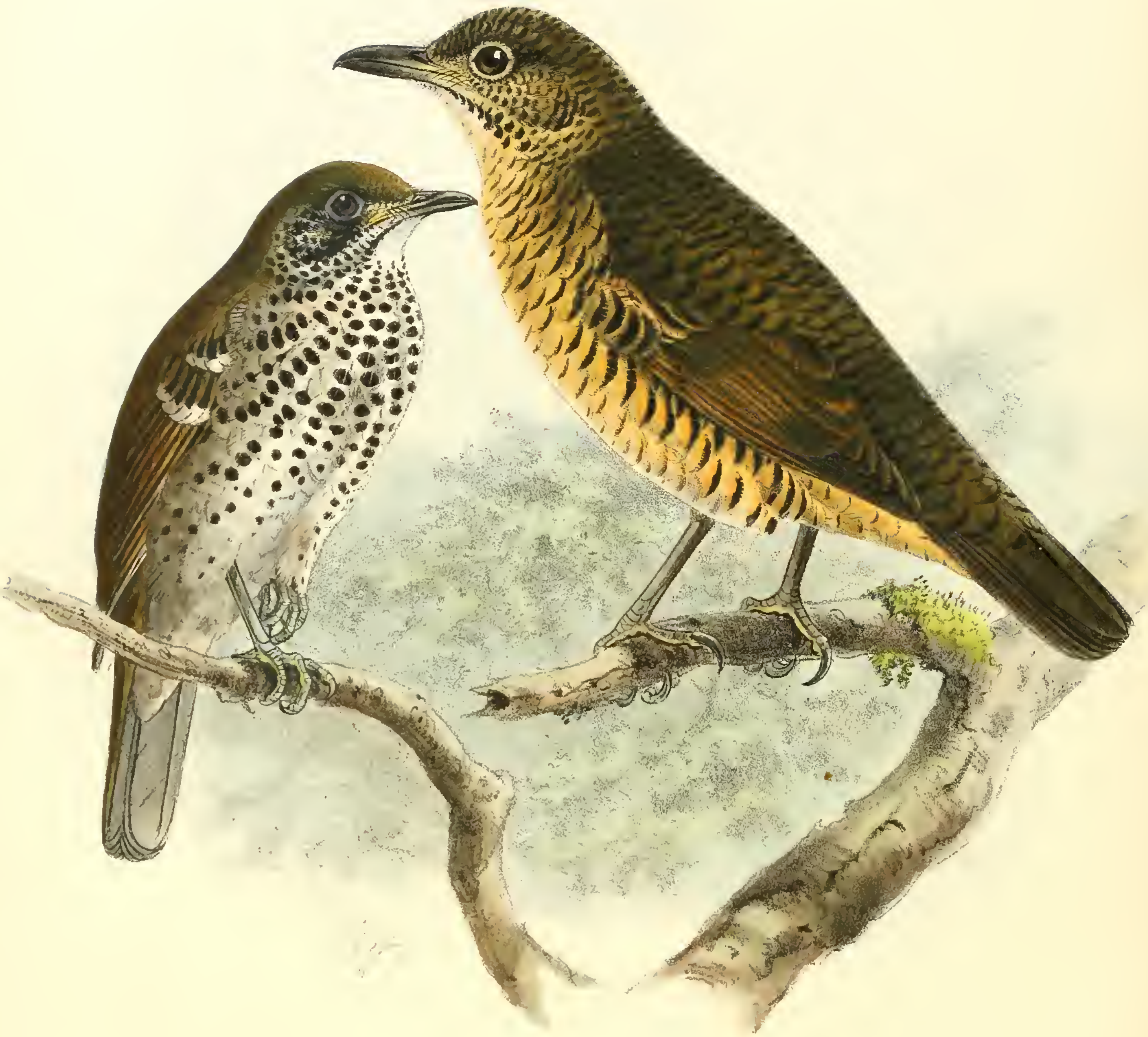
Obs. This Blackbird, which is a representative of the Nilghiri species *Turdus simillima*, has, until quite recently, been considered to be peculiar to Ceylon. Mr. Hume, however, has received specimens from Mr. Bourdillon, shot in Travancore, which he ('Stray Feathers,' 1878, p. 35) unites with the Ceylonese form, owing to the fact of their being as dark as Nuwara-Elliya examples. He remarks, notwithstanding, that they are slightly larger, measuring 4·7 inches in the wing, whereas our birds never exceed 4·6. As the distinctive character in plumage of the Nilghiri bird is its paler colour, and as it is considerably larger than *T. kinnisi*, measuring 5·0 inches in the wing, it seems not unreasonable to unite the Travancore species with the latter; and I must therefore, though somewhat reluctantly, consent to our fine Blackbird being disrated from its rank as a peculiar island species! I wish, however, that more had been said about the coloration of these newly discovered Travancore birds, namely as to whether they exhibited the peculiar slaty edgings to the upper-surface feathers which are characteristic of *T. kinnisi* from Ceylon.
Blyth in describing the species, *loc. cit.*, incorrectly called the male "jet-black," and laid stress on the proportion of the primary feathers; but these vary with age.

Distribution.—The Blackbird of Ceylon, which bears a great resemblance to our home favourite, is an inhabitant of the entire hill portion of the Kandyan Province, from the loftiest regions down to an elevation of between 2500 and 3000 feet; it is, I am given to understand, likewise found on the uppermost parts of the Morowak and Kolonna Korales, but I have not seen specimens myself from that district. It is very numerous at the Horton Plains, in the wilderness of the Peak, the Nuwara-Elliya district, and in all the forests of the main range. In Haputale, on Namooni-kuli hills, the Knuckles, and all other ranges where any considerable amount of forest has escaped the woodman's axe it is common. On isolated hills, such as the Allegalla peak, I have found it; but it is rare in such localities. In many of the coffee-districts intersected with wooded patnas, which furnish it with a stronghold, it is a familiar bird and in the north-east monsoon season appears about the residences of the planters.

Habits.—The presence of this songster at Nuwara Elliya is not without interest to the English colonist; its lively though somewhat subdued matutinal song recalls home recollections and memories of the lovely spring time in England when all nature seems awakened after the slumbers of winter. It frequents a variety of situations, passing, however, most of its existence in thick undergrowth, particularly the nilloo and elephant-grass scrub. It strays out of the forest into detached groves, copses, umbrageous coffee, and about Nuwara Elliya resorts even to the gardens and plantations surrounding the villas of the residents. It is a very shy bird, feeding entirely in the thick cover of the jungle until evening, when the departing sun illumines the borders of the forest; it then sallies out, mounting high into trees and pouring out its song, which is neither so loud nor so full in tone as that of its English congener; it then proceeds by short flights from tree to tree, uttering its call-note of *cluck-onk* until it finds its way back to its accustomed roosting-place. At the break of day it is again abroad, singing before sunrise, and shortly after it retires into neighbouring thickets for the entire day. While searching for its food it gives vent to a very low chirp, which one would imagine came from the throat of the smallest bird; and when alarmed by the sound of an approaching footstep takes refuge into the depths of the scrub with quick hoppings along the ground or short flights from branch to branch. It is very partial to some fruits in the forest, collecting in considerable flocks in the loftiest trees; and while some greedily pluck the berries from the top branches, others remain in the underwood beneath and reap a harvest on those that fall. In spite of its fruit-eating propensities, however, it is highly insectivorous in diet; and I have seen it scratching in manure at the edge of forest-paths. Layard writes that Mr. Mitford, of the Ceylon Civil Service, shot one of these birds (the only animal life he saw there) at the very summit of Adam's Peak, feeding on the crumbs of rice thrown out by the pilgrims as an offering to Buddha. Mr. Forbes Laurie writes me that it has the power of diminishing the tone of its voice until its notes have the effect of coming from a distance.

Nidification.—The Blackbird breeds from April until June, building in a niche of a trunk, on a stump, or in the forked branch of a low tree; its nest is composed of grass, moss, and roots, strengthened with a few twigs, and is somewhat massive in structure, the interior being a deep cup lined with fine roots, most probably underlaid by a foundation of mud, as in the nests of other species. The eggs are four in number, of a pale green ground-colour, blotched evenly all over with faded reddish brown and light umber, overlying smaller reddish-grey spots. Dimensions 1·05 by 0·82 inch.

In the matter of situation it has, however, a variety of choice, sometimes nesting, according to Mr. Holdsworth, in out-buildings at Nuwara Elliya, and occasionally choosing the side of a rock, as will be seen from the following experience of Mr. Bligh. He writes me:—" I have often found this charming bird's nest; on one occasion it proved to be a strange structure, composed of *seven distinct nests,* which were fixed among the roots of a bush which grew out of a perpendicular rock above the " Swallows' Cave " at Dambetenne; it contained three young ones. The situation no doubt proving very safe and suitable, induced perhaps the same pair to build successively on the old nests, all of which still presented a fresh green appearance, from the moss not readily drying in such a moist climate. Usually the nest is very like the English Blackbird's, but smaller; and the same may be said of the eggs, except that they are rather rounder. These birds nest regularly near the Catton bungalow; and directly this important business is over they retire to the higher jungle, assembling in more or less numerous parties. I have seen as many as forty or fifty at the same time in what might be termed scattered company; but this is a rare habit, and only to be accounted for by the abundance of favourite food in a particular locality."



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OREOCINCLA IMBRICATA.
TURDUS SPILOPTERA.

TURDUS SPILOPTERA.

(THE SPOTTED THRUSH.)

(Peculiar to Ceylon.)

Oreocincla spiloptera, Blyth, J. A. S. B. 1847, xvi. p. 142; id. Cat. B. Mus. A. S. B. p. 160 (1849); Kelaart, Prodromus, Cat. p. 122 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 270; Blyth, Ibis, 1867, p. 303; Holdsw. P. Z. S. 1872, p. 446; Legge, Ibis, 1874, p. 18; id. Str. Feath. 1875, p. 367.

The Thrush, Europeans in Central Province.

Val-avitchia, lit. "Wild Ant-thrush," Sinhalese.

♂ *ad.* suprà olivascenti-brunneus, vix rufescens, uropygio tamen et supracaudalibus magis rufescentibus: tectricibus alarum minimis dorso concoloribus, medianis nigris conspicuè albo terminaliter maculatis, majoribus interioribus dorso concoloribus, exterioribus nigris dorsi colore extùs lavatis et albo terminatis: secundariis dorso concoloribus, primariis nigricanti-brunneis, extùs dorsi colore lavatis: rectricibus mediis olivascenti-brunneis, reliquis saturatè brunneis extùs olivascenti-brunneis: loris albidis: annulo ophthalmico purè albo: facie laterali albidâ, plumis nigro terminatis, maculâ infraoculari nigrâ: supercilio albido, supra regionem paroticam indistincto: corpore subtùs albo, præpectore maculis nigris triquetris magnis ornato: pectore quoque maculato, maculis tamen minoribus et magis ovalibus: gulâ, abdomine toto, subcaudalibus et corporis lateribus grisescenti-brunneo lavatis: subalaribus albis, majoribus basaliter nigris: axillaribus albis nigro terminatis: remigibus infrà brunneis, secundariis ad apicem pogonii interni albis: rostro nigricanti-brunneo: pedibus corneo-plumbescentibus, unguibus pallidè brunneis: iride clarè brunneâ.

Adult male and female. Length 8·0 to 8·7 (average 8·4) inches; wing 3·8 to 4·1; tail 3·0 to 3·2; tarsus 1·3 to 1·5; mid toe and claw 1·1 to 1·25; bill to gape 1·05 to 1·2.

Iris brown; eyelid leaden grey; bill blackish, pale at gape; legs and feet dusky bluish grey or greyish fleshy, claws dusky horn.

Above olive-brown, more or less pervaded with a rusty hue, chiefly on the lower back and upper tail-coverts; least wing-coverts concolorous with the back; primaries and secondaries brown, washed with olive on the outer webs; median and greater wing-coverts with a terminal white spot, smallest on the greater series, which have their outer webs concolorous with those of the quills; tail rusty olive-brown, crossed with faint dark rays towards the end, and with the inner webs dusky; lores and a narrow imperfect supercilium whitish; beneath the eye and the ear-coverts black, the latter crossed obliquely by a white patch; on the lower part of the cheek the feathers are tipped blackish; chin, throat, and under surface white, the feathers on the lower fore neck, chest, and breast with oval bar-like terminal blackish spots; flanks and sides of ventral region smoky olivaceous grey; thighs olivaceous on the exterior side; under wing-coverts white, with a blackish bar formed by the tips of the median row and the bases of the succeeding one.

Females. Have the upper surface, as a rule, more rusty than males, and sometimes a buff hue on the throat and parts of the under surface.

Examples of both sexes vary in the extent of the spottings on the chest and sides of breast.

Young. The nestling, when leaving the nest, has the bill brown, with the base and the tip yellowish; legs and feet bluish fleshy. Upper surface ferruginous brown, generally darker on the head and most rufous on the rump and upper tail-coverts; the hind neck, back, and scapulars with fulvous mesial lines, and the tips of the coverts the same; the markings of the face, ear-coverts, and sides of neck buff instead of white; prevailing hue of the under surface the same; the chin and abdomen whitish; chest and sides of breast with blackish edgings; the cheek-patch and spot on the upper eyelid blacker than in the adult.

During the first few months the bill becomes black, and the ferruginous and buff livery is doffed, the white, black-spotted feathers of the chest and under surface first appearing.

Obs. This Thrush varies, according to climate, in the hue of its upper surface. As might be expected, in the dry forests of the north and east this is ferruginous, while up-country and Saffragam birds are quite olivacecus in their coloration.

Obs. Blyth placed this bird in the subgenus *Oreocincla* of Gould, the characteristic of which is that the back and breast are marked with crescentic edgings of dark brown. Inasmuch, however, as it has a plain upper surface, it cannot well belong to *Oreocincla*, and, in fact, it is a true *Turdus*. The wing is slightly more rounded than in typical species of this genus, the 5th quill usually proving the longest, and the 2nd is considerably shorter than the 3rd; but were variations in the wing-formula of such birds as the Thrushes to be taken as sufficient basis for the establishment of genera, we should have a useless multiplication of them.

The nearest Indian ally of our Spotted Thrush is *T. mollissima* from the sub-Himalayan region. This species is brownish olive above, some examples having a rusty tinge; the greater and median wing-coverts have fulvous-white tips: beneath white, tinged with buff on the throat and chest, and spotted with black on those parts; the feathers of the breast and flanks with slightly crescentic-shaped tips of black, and in this last feature it differs from our bird. Wing 5·4 to 5·6 inches.

Distribution.—The Spotted Thrush, which is the Ceylon representative of the Indian Plain-backed Thrush, was discovered by the late Dr. Templeton. It is an inhabitant of the central hill-region, from about 4000 feet downwards, being not at all uncommon in Uva and in the less elevated district of Dumbara. From the base of the hills, where it is more frequent, it spreads outwards, particularly in the forest-districts, and in the western and southern parts of the island is found within a few miles of the sea. In Saffragam, and on the well-wooded tract lying between Ratnapura and Dambulla, along the base of the western ranges, as also in the Pasdun, Raygam, and Hewagam Korales, it is more often heard and seen than in other parts of the low country; and I and others have procured it within a few miles of Colombo. In the low-hill jungles of the south-west it is scarcely less frequent. In the forests of the Wanni and those of the Friars-Hood group I have procured it; but it is rarer in those parts than in the bamboo-jungles of the Western Province.

Habits.—A shy, retiring bird, this species frequents damp jungle, undergrowth in forests, and bamboo-thickets, not often mounting to any height on trees, but passing its time near the ground, about which it hops quietly, picking up pupæ, Coleoptera, and other insects; and when alarmed it runs very quickly through underwood, uttering a weak chirping note. The male has a very pretty whistle, ending in a human-like note, which it utters, seated on a low branch, for a considerable time at intervals throughout the day, but chiefly in the morning and evening. Both sexes have a weak, almost inaudible "*tzsee,*" which they utter, as the Blackbird does, while searching for food. It does not often come into the open; but at sunset I have now and then seen it in little copses of guava and other small trees which are to be found in the meadows on the banks of some of the western streams; and I once shot one whistling in a clump of the tall bamboo (*Bambusa thouarsi*). The young bird quickly acquires its vocal powers, and whistles as sweetly in the soft-gape stage as an adult.

A singular theory obtains among the Sinhalese with reference to this species and the Pitta or Ground-Thrush. They have a tradition that Buddha, in former times, changed some of the spotted Thrushes into Pittas, a bird which they likewise style "*Avitchia;*" and they believe that these beautiful birds are the progeny of the Spotted Thrush, asserting, however, that the young of both species are to be found in the nest of this latter bird. The fact of the *Pitta* being a migratory bird, and appearing in the island suddenly, no doubt is the cause of this imaginative mode of accounting for its arrival.

Nidification.—I have found this bird nesting in the northern forests near Trincomalie in January, and I obtained a young nestling in Uva in September. Mr. MacVicar has taken its eggs at Kæsbawa, near Colombo, in May; the breeding-season, therefore, extends over the first half of the year. The nest is placed in the fork of a sappling a few feet from the ground, or among the roots of a tree on a bank or little eminence, and is a loose-looking, though compactly put together structure of small twigs, roots, moss, and grass, lined with finer materials of the same, the egg-cavity being a deep cup, tolerably neatly finished off. The eggs are two or three in number, of a pale bluish-green ground, freckled throughout with light reddish brown, or light red and reddish grey, over a few lilac spots at the obtuse end, the markings in some being confluent at that portion; they are regular ovals in shape, measuring from 1·06 to 1·17 in length, by 0·74 to 0·77 in breadth.

The figure on the Plate accompanying this article is that of a male shot on the Sittawak ganga, a large affluent of the Kelani ganga.

TURDUS WARDI.

(WARD'S PIED BLACKBIRD.)

Turdus wardii, Jerdon, J. A. S. B. 1842, xi. p. 882; id. Ill. Ind. Orn. pl. 8 (1847); G. R. Gray, Gen. Birds, i. p. 219 (1845); Brooks, Str. Feath. 1875, p. 237.

Merula wardii, Blyth, J. A. S. B. 1847, p. 146; id. Cat. B. Mus. A. S. B. p. 163 (1849); Kelaart, Prodromus, Cat. p. 122 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 270; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 402 (1854).

Turdulus wardii, Jerdon, B. of Ind. i. p. 520 (1862); Holdsw. P. Z. S. 1872, p. 445.

Cichloselys wardii, Hume, Nests and Eggs, p. 231 (1873).

Oreocincla pectoralis, Legge, Str. Feath. 1876, p. 244 (young male); Hume, ibid. 1877, p. 202.

Ward's Thrush, Kelaart; *Pied Blackbird* in India.

Adult male and female. Length 8·0 to 9·0 inches; wing 4·3 to 4·8; tail 2·9 to 3·3; tarsus 0·95 to 1·1; mid toe and claw 1·0 to 1·1; bill to gape 1·1 to 1·15.

Male. Iris brown; bill yellow, dusky at base of culmen; legs and feet amber-yellow; claws yellow.

Whole head, neck, chest, upper surface, wings, and tail black; a broad supercilium from the bill to the nape, terminal portion of wing-coverts (forming a patch on the lesser row), tips of all but the outer quills and their inner edges at the base, a portion of the outer margins of the longer primaries, tips of the rump, and upper tail-covert feathers, together with the under parts from the chest downwards, white; two outer pairs of rectrices wholly white, except a portion of the outer webs; remaining rectrices successively less white towards the centre, the colour chiefly confined to the inner webs; flank- and thigh-coverts black, with deep white tips.

Female. Iris as in the male; bill brown, pale at the base; legs and feet brownish yellow.

Head, upper surface, wings, and tail olive-brown; lores dark brown, a fulvous streak from the nostril over the eye; wing-coverts with a large terminal fulvous spot; primaries with a pale edge, most conspicuous on the three long outer ones; basal portion of both primaries and secondaries buff-white; upper tail-coverts tipped with whitish; two outer tail-feathers with a terminal white patch running up the centre; throat and fore neck buff-white, the feathers with a dark brown terminal band, and the concealed portion with lateral indentations of the same; centre of the throat unmarked: breast, lower parts, and flanks white, with terminal bars of blackish brown, except on the centre of the breast, abdomen, and under tail-coverts; lower flanks well covered with brown, owing to the depth of the dark tips; under wing-coverts white, crossed with a brown bar.

Young. The male of the year is coloured similarly to the female, but the upper surface is of a darker or richer brown, the ear-coverts are darker, the secondaries and tertials are more or less tipped with buff-white, and the tippings of the upper tail-coverts whiter than in the female; tail tipped similarly to the female; supercilium similar; centre of the throat and lower part of the face buff, the latter with the feathers tipped brown; sides of the gorge blackish brown, and the feathers of the chest olive at the tips and sides, within which is a blackish rim enclosing an oblong patch of white; the olive coloration imparts the appearance of a *band across the chest*; breast and lower parts purer white than in the female, with deep terminal blackish bands, except down the centre; under tail-coverts edged laterally with dark brown. This plumage is probably doffed at the second autumn moult, and the pied dress forthwith assumed.

Obs. The above is a description of the plumage in which I described the young male of this species as *Oreocincla pectoralis*. Not being acquainted with the young male at the time, and finding that the specimens I acquired from Mr. Thwaites differed from the female (an example of which in my collection had been shot by Mr. Forbes Laurie) in the olive pectoral band, I was erroneously led to consider it new. Mr. Hume remarks (Str. Feath. 1877) that this Thrush is such a common and well-known species, that it could not well be described as new. This is, however, not the case as regards collections in England, in which young males and females are very rare; there is no specimen of either in the British Museum; and the late Lord Tweeddale was the only naturalist in whose collection I have

seen the immature male. *Turdus sibiricus*, regarding which Mr. Hume himself was led into error, is, perhaps, a commoner bird in English collections.

This species is usually placed in the subgenus *Turdulus*, on account of its pointed wing (the 3rd quill being the longest, and the 2nd not much shorter than it) and the sexes differing in coloration; the tarsus is somewhat shorter than in the typical Blackbirds. I prefer, however, to simplify matters by keeping it in *Turdus*, and pointing out here its characters as a *subgenus*.

Distribution.—The Pied Blackbird is a cool-weather migrant to the hills of Ceylon, arriving late, during the month of November, and leaving again at the latter end of March or early part of April. It does not appear to locate itself in the same localities every year, or else its numbers vary considerably, for in some seasons it is almost wanting in districts in which it has commonly been observed. It is found in most of the upper regions of the Kandyan Province, from the altitude of Nuwara Elliya down to about 2800 feet; but it is most common between 3000 and 4000 feet in the Knuckles ranges, Kotmalie, Dickoya, Uda Pusselawa, Uva, and Haputale. In some years it occurs in considerable numbers between the Elephant Plains and Kandapolla, Mr. Watson informing me that he has seen it in flocks in the patna-woods near Ragalla. In November and December it has been several times seen in Hakgala Gardens, to which it is attracted, with many other species, in search of the insectivorous food harboured in the bare soil beneath the conifers and other choice trees with which this beautiful spot abounds. I have no doubt that it finds its way, in small numbers, into all the forests of the main range.

Jerdon writes of this Blackbird's distribution in India as follows:—It is "spread, but very sparingly, through the Himalayas, and during the winter in the plains of India; I first procured it through Mr. Ward at the foot of the Nilghiris, and afterwards obtained two specimens from Nellore in the Carnatic; Hodgson procured it at Nepal, and it has also been obtained in the North-west Himalayas, where it is far from uncommon." He further says, "Whether those birds met with near the Nilghiris also migrate northwards or are permanent residents there or on other mountain-ranges cannot now be decided." I observe that neither Mr. Fairbank nor Mr. Bourdillon procured it in the Travancore and Palani hills, where it should be found if it were a resident in the Southern ranges of India; and the inference therefore is that it does migrate to the south from its headquarters in the Himalayas. Mr. Brooks remarks that it is common at Mussoori.

Habits.—This species frequents the outskirts of forest, patna-jungle, detached woods, and frequently visits therefrom the gardens of the planters, in which its frugivorous habits cause it to do a considerable amount of mischief. It is very partial to mulberries, and, in fact, does not seem to turn aside from any fruit grown in the hills of Ceylon. Mr. Bligh, who has seen it frequently in Kotmalie and Haputale, tells me that it collects in scattered flocks to feed on the fruit of the guava and wild fig, uttering a chirping note while so doing. Young males, which Mr. Thwaites observed in the Hakgala Gardens, were very shy, flying up from the ground, when flushed by him, into low trees, and then escaping into the surrounding jungle; they frequented the manure-heaps near his bungalow, and had a low cry like that of a young Blackbird. Its song, heard at Mussoori by Mr. Brooks, and which, I conclude, is only uttered during the breeding-season, is described by him as "a strange one of two notes, and quite unmusical."

Nidification.—As regards the breeding of this Blackbird in India, the testimony of Messrs. Marshall, Hutton, and Hodgson, as quoted by Mr. Hume in his 'Nests and Eggs,' proves that, on arriving from the south in the Himalayas in May and June, it commences to nest, building either in the fork of a branch of a tall tree, or placing its habitation in a low situation, such as on a stump. The nest is a "compact, cup-shaped structure, built of moss and dead leaves, cemented together with a little mud and lined with roots;" the interior has a diameter of about 3 and a depth of 2 inches. The eggs are four in number, and are, according to Mr. Hodgson, pale verditer, spotted with sanguine brown;" and one specimen, in the possession of Mr. Hume, is described by him as of a "pale sea-green ground, blotched, spotted, and streaked, most densely at the larger end (where also a number of small pale purple clouds seem to underlie the primary markings), with a moderately bright, somewhat brownish red." Dimensions from 1·01 to 1·06 inch in length by 0·74 to 0·76 in breadth.

Genus OREOCINCLA.

Bill stout and longer than in *Turdus*. Tail variable, consisting, in some members of the group, of 14 feathers.

Plumage above and beneath with dark scale-like tippings.

OREOCINCLA IMBRICATA.

(THE BUFF-BREASTED THRUSH.)

(Peculiar to Ceylon.)

Zoothera imbricata, Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 212; Jerdon, B. of India, i. p. 509 (1863).

Oreocincla nilghiriensis, Jerdon, Ibis, 1872, p. 139; Holdsw. P. Z. S. 1872, p. 456.

Oreocincla imbricata (Lay.), Hume, Str. Feath. 1873, p. 437.

Oreocincla gregoriana (Nevill), id. *tom. cit.*

Ad. suprà ochrascenti-brunneus, plumis omnibus conspicuè nigro marginatis, quasi lunulatis, uropygii et supracaudalium marginibus angustioribus: pilei plumis subterminaliter clariùs ochrascentibus: tectricibus alarum nigris ad apicem olivaceo-brunneo maculatis et aureo-brunneo terminatis: tectricibus primariorum nigris extùs versùs basin latè aureis: remigibus nigricanti-brunneis, extùs dorsi colore lavatis et aureo-brunneo marginatis: rectricibus duabus medianis olivascenti-brunneis, reliquis nigricanti-brunneis, exterioribus pallidioribus: loris albicantibus: regione paroticâ aureo-fulvâ, plumis nigro terminatis et medialiter albido striolatis: genis aureo-fulvis nigro maculatim terminatis: gulâ aureo-fulvâ immaculatâ: corpore reliquo subtùs aureo-fulvo, plumis nigro fasciatim terminatis: hypochondriis paullò latiùs nigro ad apicem fasciatis: abdomine et subcaudalibus aureo-fulvis immaculatis: rostro brunneo, mandibulâ pallidiore: pedibus brunneis.

Adult male. Length 9·3 to 9·6 inches; wing 4·8 to 5·05; tail 2·9 to 3·0; tarsus 1·1 to 1·15; middle toe and claw 1·15 to 1·2; bill to gape 1·38 to 1·53, average length 1·4.

Adult female. Wing 4·65 to 4·8.

These measurements are taken from a series of 14 examples in my own collection and those of the late Lord Tweeddale, Messrs. Bligh, Holdsworth, and Thwaites.

Iris brown; bill blackish brown, paling at the base of the lower mandible; legs and feet fleshy brown, some with a bluish tinge; claws brownish at the tips.

Head and upper surface brownish olive, paling slightly on the rump and upper tail-coverts, each feather with a broad black, crescentic-shaped tip, imparting a scale-like appearance to the upper plumage; wings dark brown, the secondary-coverts tipped and externally margined with dusky buff, the tips of the median series being the palest; the primary-coverts, with the tips and inner webs, black, and a rufous-buff wash on the outer portions of the feathers; quills margined with yellowish brown, spreading over the outer webs of the innermost secondaries; tail brownish olive, the three feathers next the outermost on each side blackish with pale tips.

Face and under surface rich buff, paling on the chin and abdomen into whitish buff, and darkening on the sides of the chest and flanks into olivaceous, each feather, except those of the gorge and abdomen, with a bold black crescentic tip; ear-coverts with pale shafts and (as also the face) tipped less blackly than the under surface, the dark tips taking the form of a stripe on each side of the throat; under wing-coverts black, with the terminal half of the feathers white; under tail-coverts unmarked.

Females are coloured exactly like the males.

Obs. The subgenus *Oreocincla*, founded by Gould for the reception of some Thrushes with the peculiar type of marking above noticed, may, I think, be allowed to stand, not on account of this character, but because its

members differ from true *Turdus* in the bill and vary in the number of their tail-feathers. Their wings are those of a typical Thrush and so are their habits. The present species is a typical example of this group.

It was united by Jerdon ('Ibis,' 1872) with the above-named Nilghiri species, inasmuch as he states, in his supplementary notes to the 'Birds of India,' that the "*Zoothera imbricata* of Layard turns out to be *Oreocincla nilghiriensis*." On what evidence this statement was made I am not aware, but it is certain that *O. nilghiriensis* is a very distinct species. Mr. Hume avers this, *loc. cit.*, and gives the testimony of Mr. Davison, who is acquainted with the bird in all its stages, concerning the *white under surface* which is characteristic of it. It is very rare in European collections; but the magnificent collection of that distinguished ornithologist the late lamented Lord Tweeddale contains a fine example which I have lately had the opportunity of examining. Its measurements are:—wing 5·4 inches; tail 3·7; tarsus 1·2; middle toe and claw 1·2; bill to gape 1·42. It is paler than *O. imbricata* on the upper surface, particularly as regards the lower back and rump, and the feathers have their dark tips pervaded by a pale fulvous ray or patch, which is particularly noticeable on the head, hind neck, and rump; the pale tips of the median and greater wing-coverts are lighter than in our bird and much larger; the under surface, together with the throat and fore neck, is *white*, slightly tinted with buff on the sides of the throat and on the lower part of the fore neck; but the breast and lower parts are pure white; the terminal markings of the feathers of the chest, upper breast, and flanks are very bold and deep, and the belly is almost unmarked.

With regard to the specific name of this Thrush, it is evident, from Layard's description of his specimen, that it was no other than the present species; he writes:—"On the breast the colours are pale rufous-yellow, darkening into deep rufous with very dark brown edge; vent and under tail-coverts rufous." A specimen was sent some years ago by Mr. H. Nevill, of the Ceylon Civil Service, to Mr. Hume, and the name *O. gregoriana* (after Sir Wm. Gregory, late Governor of Ceylon) proposed for it, from which I conclude that the fact of its having been already named by Layard was overlooked.

Distribution.—This fine Thrush was first noticed and described by Layard, *loc. cit.*, from a specimen that he discriminated in the collection of Mr. Thwaites, who was, therefore, its discoverer. Where this gentleman procured it Layard does not mention, but, as a matter of fact, it is found throughout the main range and in the uncleared portions of most of the coffee-districts; it is decidedly an uncommon bird, and, being very shy and retiring, almost entirely escapes observation. It is most frequently met with in the high land round Nuwara Elliya and in the wilderness of the Peak; but I have seen it in Maturata, and procured it in a small wood on Allegalla mountain, where it is not unfrequent, and where Mr. Farr likewise has obtained several examples. Mr. Thwaites informs me that it makes its appearance at the beginning of every year from the surrounding jungle in the Hakgala Gardens, in which the open though secluded ground and the ample shelter of shady conifers afford it a favourite feeding-place. I do not think it descends below an altitude of 3000 feet, at which I procured it at Allegalla, and also observed it in the forest on the Peak above Gillymally.

Habits.—The Buff-breasted Thrush dwells almost exclusively on the ground, from which it rises, when startled, with a loud flutter, and taking a short irregular flight, suddenly drops again. I have always observed it alone, and have met with it in openly timbered forest and in thick willow-scrub. It appears to feed on insects, which it procures beneath fallen leaves; and Mr. Thwaites informs me that it scratches much in rubbish thrown out at the borders of his plantation, and when flushed betakes itself to a low branch and then disappears into the adjacent forest.

I can give no particulars as to its nidification.

The figure in the Plate accompanying my article on *Turdus spiloptera* is that of a female shot in jungle at the summit of Allegalla peak.

Subgenus GEOCICHLA.

Bill somewhat short ; a naked space at the posterior corner of the eye ; otherwise as in *Turdus.*

GEOCICHLA CITRINA.

(THE ORANGE-HEADED THRUSH.)

Turdus citrinus, Lath. Ind. Orn. i. p. 350 (1790).

Geocichla citrina, Blyth, J. A. S. B. 1847, xvi. p. 145 ; id. Cat. B. Mus. A. S. B. p. 163 (1849) ; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 189 (1854) ; Jerdon, B. of Ind. i. p. 517 (1862) ; Hume, Nests and Eggs, i. p. 229 (1873) ; Ball, Str. Feath. 1874, p. 407 ; Hume, ibid. 1875, p. 114 ; Oates, ibid. 1877, p. 151 ; Hume & Davison, B. of Tenass., Str. Feath. 1878, p. 250.

Geocichla layardi, Walden, Ann. & Mag. Nat. Hist. 1870, v. p. 416 ; Holdsw. P. Z. S. 1872, p. 445, et 1877, p. 160.

The Orange-headed Ground-Thrush (Jerdon) ; *The Rusty-throated Bush-Thrush* (Hume).

Adult male (Darjiling). Length (from skin) about 8·5 inches ; wing 4·5 ; tail 2·9 ; tarsus 1·25 ; mid toe 0·8, claw (straight) 0·25 ; bill to gape 1·0.

Adult (Nepal). Wing 4·5 inches ; tail 3·0 ; bill to gape 1·1.

" Bill blackish brown ; gape and base of lower mandible fleshy ; eyelids greenish plumbeous ; iris dark hazel ; legs, feet, and claws fleshy pink " (*Oates*, Pegu).

Adult male (Ceylon, *G. layardi*). Length (from skin) 8·5 inches ; wing 4·5 ; tail 2·7 ; tarsus 1·2 ; mid toe 1·05, claw 0·25 ; bill to gape 1·0.

Iris brown (?) ; bill dark brown, pale at the base, the gape yellowish ; legs and feet fleshy yellow ; claws yellowish brown.

Forehead, top of the head, back and sides of neck rich aureous chestnut, paling on the throat, fore neck, entire breast, and flanks into a more fulvous hue, the lores, chin, and gorge being lighter than the fore neck ; lower part of hind neck, back, scapulars, wing- and upper tail-coverts glistening bluish grey, each feather with a broad paler grey margin ; terminal part of median wing-coverts, belly, thighs, and under tail-coverts white, tips of the greater secondary coverts whitish ; quills brown, the outer webs of a paler grey than the edgings of the upper surface ; tail bluish grey, brown on the inner webs of all but the central feathers, and the whole crossed by dark rays, almost obsolete on the latter.

Female. Length 8·0 inches ; wing 4·4 ; tail 2·5 ; tarsus 2·15 ; mid toe 0·75 ; bill to gape 0·95.

Chin and throat more albescent than in the male ; entire abdomen and sides, vent, and under tail-coverts white ; interscapular region, scapulars, and lesser wing-coverts washed with olivaceous greenish, the central parts of the feathers being slaty ; upper tail-coverts tinged with olivaceous in a less degree.

The above are descriptions of the only male example I have seen from Ceylon (which is the type of Lord Tweeddale's *G. layardi*) and of a female procured at Jaffna, and now in Mr. Holdsworth's collection.

The following is a comparison of the two Indian specimens of which the dimensions have been given above :—

Darjiling. Somewhat paler in its rufous colour than the above ; distribution of the white on the abdomen and lower flank-plumes exactly the same ; wing-bar similar.

Nepal. As dark as, if not darker than, the Ceylonese specimen in its rufous coloration ; less white on the abdomen.

Obs. The Ceylonese Orange-headed Thrush was separated from the North-Indian form by the late Lord Tweeddale, and named by him *G. layardi*. It was stated, *loc. cit.*, " to be readily distinguished by the much deeper orange of

the head and nape, these parts being of the same dark shade of orange-brown characteristic of *G. rebecula*, Gould. ex Java. On the under surface the orange tints are brighter and richer than in *G. citrina*, yet not nearly so dark as in *G. rubecula*; the blue-grey portion of the plumage is likewise darker than in *G. citrina*, but not so dark as in *G. rubecula*." I have, however, examined a considerable series and find that the species is most variable. As regards the depth of the orange-rufous colour of those I have examined, I have given two examples to show the variation in this respect. There is less white on the lower parts of some specimens from North India than in the type of *G. layardi*; but Mr. Hume, in his paper on the birds of Tenasserim, shows this to be a variable characteristic also. There is no difference in the size of wing or tail, and, in fact, if the type of *G. layardi* be laid by the side of a *series* of *G. citrina* it is not possible to separate the two.

G. rubecula, from Java, is smaller than the present and has no wing-spot; the head is dusky orange-rufous, the back and wings as in *G. citrina*, and the under surface very dark chestnut, but scarcely any darker than some specimens of the last-mentioned species, which it quite resembles in the colour of its back and wings. Wing 4·0 inches; tail 2·8; tarsus 1·15. *G. cyanotus* is a specialized form inhabiting the jungles of Southern India, and differs notably from the two foregoing in the coloration of the face and throat; the chin and throat are white; cheeks and ear-coverts black, with a white bar across them; the under surface yellower than in *G. citrina*.

Distribution.—This handsome Thrush has only been, as yet, procured three times in the island; and as the dates of its occurrence fall within the duration of the cool season, the hypothesis is that it is migratory, coming from Northern India, as is evidently the case with several other birds, *viâ* the east coast of the peninsula, and thus avoiding the jungles of the southern ranges, in which it has never been noticed. The first specimen obtained in Ceylon, and already referred to above, was shot by Mr. Spencer Chapman at a place called Kondawathawan, near Ambaré, in the Eastern Province, and sent by that gentleman to Lord Tweeddale. A second example was shot by Mr. F. Gordon, of the Oriental Bank, in open country near Jaffna, in the beginning of 1876, proving, since the species is by habit a forest bird, that it had recently arrived in the island. A third was killed in March 1877 on the banks of the Kirinde ganga, in the Hambantota district, by one of the collectors of the Colombo Museum, in which it is now preserved. It will be observed that the localities in which it has occurred are very far apart; and it is evidently a species which is extremely rare in Ceylon. For five years I was constantly on the look out for it in forests in all parts of the island (indeed there was no species the possession of which I so much desired), but I never saw a sign of it anywhere.

In India this species is found chiefly in the sub-Himalayan region, extending as far westward as Mussoorie. It is not uncommon in Nepal and about Darjiling, and appears to move about in Sikhim, depending on circumstances connected with the vegetation of various districts in that province. Mr. Gammie writes of it:—"*G. citrina* is another bird that has become common in the shady cinchona-plantations. Until a year ago I never saw it except near the bottom of our warmest valleys and in the Terai, where it is abundant; but this year (1877) we have it in large numbers up to 4000 feet." Further south, in Bengal, it has been obtained by Captain Beavan at Maunbhoom and by Col. Tickell in Singbhum; in the Rajmehal hills and in the neighbourhood of Calcutta it is not uncommon (*Ball*). Jerdon says that it has been found in the forests of Central India, extending rarely as far south as 10°; he met with it in the jungles of the Eastern Ghâts. Further east it is recorded by Mr. Inglis from Cachar, and thence it extends into Pegu and southwards into Tenasserim. Mr. Oates remarks:—"Though not often *seen*, this is really a common bird from Thayetmyo to Tonghoo;" and as regards Tenasserim, Mr. Hume writes that it is "apparently confined to the southern half of the Province, and there to the neighbourhood of the coast, reappearing in the extreme north." Lieut. Wardlaw Ramsay procured it at Karennee.

Habits.—This handsome bird is a denizen of forest, heavy jungle, and shady groves. The specimen mentioned above as shot in the Hambantota district was met with in forest on the river-bank, and the country in which Mr. Chapman's bird was procured is covered with heavy jungle. Mr. Davison writes of it as keeping to "forest, but to the more open portions along the beds of streams, near the forest-paths, &c. It feeds usually on the ground, turning over the dead leaves, hunting for insects, which chiefly constitute its food." The writings of Jerdon afford the same testimony as to its habit of turning over leaves, and he says, also, that it keeps to woods and shady gardens, preferring bamboo-jungle; it often has "its bill clogged with mud, from feeding in damp spots. It is shy and silent in general, but during the breeding-season the male

has a pretty song." Captain Hutton likewise writes that it is a true forest bird, "building in trees and taking its food upon the ground, finding it in berries and insects among the withered leaves, which they expertly turn over with their beaks; and hence the reason why the bill is almost invariably clothed with mud or other dirt."

Nidification.—This species breeds in the Himalayas and in Pegu from April until June. Its nest has been found by Messrs. Hutton, Marshall, Thompson, and Oates, and appears to be built sometimes in the fork of the branch of a low tree and at others constructed in a similar situation at a considerable height from the ground. Captain Hutton says that it is composed of coarse dry grasses, somewhat neatly interwoven on the sides, but hanging down in long straggling ends from the bottom. Within this is a layer of green moss and another of fine dry woody stalks of small plants, and a scanty lining at the bottom of fine roots. Another, found by Mr. Oates in a ravine near Pegu, was situated about four feet from the ground, made of roots and strips of soft bark, the ends of some of the latter hanging down a foot or more; the interior lined with moss and fern-roots; the interior diameter about 4 inches and the inside depth about 2 inches. The eggs are usually three or four in number, sometimes five. The ground-colour is described by Mr. Hume as "dull greyish or greenish white, with a conspicuously mottled and speckled red-brown cap at the large end; they vary from 0·82 to 1·1 inch in length, and in breadth from 0·7 to 0·82 inch."

Genus MONTICOLA.

Bill straight, rather wide at the base; the culmen only curved at the tip, which is suddenly bent down. Nostrils oval and exposed. Wings long in proportion to the tail; the 1st quill equal to the primary-coverts; the 3rd the longest, 2nd subequal to the 5th. Tail rather short, even at the tip. Tarsus with an inclination to be scutellated and rather short.

MONTICOLA CYANA.

(THE BLUE ROCK-THRUSH.)

Turdus cyanus, Linn. Syst. Nat. i. p. 291 (1776).

Monticola cyanus (L.), Boie, Isis, 1822, p. 552; Shelley, B. of Egypt, p. 70 (1872).

Petrocossyphus cyanus (L.), Boie, Isis, 1828, p. 319; Jerd. B. of Ind. i. p. 511 (1862); Sharpe & Dresser, B. of Eur. pt. 8 (1871); Hume, Str. Feath. 1873, p. 179; Howard Irby, B. of Gibraltar, p. 74 (1875); Legge, Str. Feath. 1876, p. 249 (first record from Ceylon); Whyte, ibid. 1877, p. 203.

Petrocincla pandoo, Sykes, P. Z. S. 1832, p. 87.

Petrocincla cyanus (L.), Jerdon, Ill. Ind. Orn. pl. 20 (1847); Blyth, Cat. B. Mus. A. S. B. p. 164 (1849).

Cyanocincla cyanus (L.), Hume, Nests and Eggs, 1873, p. 226.

Cyanocincla cyana (L.), Ball, Str. Feath. 1874, p. 407; Butler, ibid. 1875, p. 470; Bourdillon, ibid. 1876, p. 398; Hume & Davison, ibid. 1878, p. 247.

Blaumerle, German; *Solitario*, Portuguese. *Shāma*, Hind. South of India; *Pandu* (male), *Maal* (female), Mahrattas; *Podda kachi-pitta*, Tel. (Jerdon); *Tchau-tchau zerak*, Moorish (Howard Irby).

Adult male and female. Length 6·3 to 9·0 inches; wing 4·5 to 4·8; tail 3·25 to 3·8; tarsus 1·1; bill to gape 1·2 to 1·3.

These measurements are from a series of specimens from widely spread localities.

Iris brown; bill, legs, and feet black.

Adult male (spring plumage, Mus. Seebohm). Upper and under surface dull blue, brightening into silvery blue on the forehead and crown; the face and throat the same, but less bright; lores and a fringe round the eye black; wings dark brown, the outer webs of the primaries and secondaries edged with dull blue; the primary-coverts and outer feathers of the median series with fine light edgings; quills faintly tipped light; tail slightly darker than the wings, the feathers margined with blue; breast and belly a duller blue than the breast, and with a few light tippings to the abdominal feathers.

In winter the adult male has the feathers edged with brown, and the blue is not so bright.

Adult female (normal dress). Above greyish brown, the feathers of the head with faintly indicated pale edgings, and the same on the rump; lores fulvous-grey; throat and fore neck fulvous, each feather with a dark brown edging; on the chest the feathers change into greyish brown, with the fulvous hue gradually reduced, and the dark edgings change into terminal bars on each feather, preceded by a fulvous patch; the under tail-coverts are generally of a richer hue than the rest—that is, rufescent fulvous, boldly barred with blackish. Messrs. Sharpe and Dresser contend, in their long and able review of the plumage of this species, that the female eventually assumes the blue dress of the male, in support of which theory they examined correctly identified specimens from various parts of Europe. It would appear, however, that the majority of female birds are shot in the brown dress—Mr. Hume having acquired a very large series from all parts of India, out of which only three were in the blue livery, which is, perhaps, merely the result of advanced age or barrenness, in which latter stage not a few species put on the plumage of the male.

Young. The nestlings of both sexes are alike, being brown, with dusky bars and light spottings; this dress is doffed by the male at his first autumn moult. Messrs. Sharpe and Dresser instance an example, shot in Macedonia in August, which was in a "state of change," moulting from the downy mottled white feathers to the blue immature dress, in which the upper feathers have white tips preceded by a black line; most of the feathers were shaded with brownish, as in the winter plumage of the adult.

An immature male in my collection, shot in March in Ceylon, appears to be in the next stage to the adult dress. The blue plumage of the upper surface is intermingled with brown pale-tipped feathers, principally on the head and hind neck; the wing-coverts, shorter tertials, and upper tail-coverts are tipped with white; the primaries and secondaries are tipped pale; under surface pale blue, lightest on throat; the chest-feathers are brown terminally, their extreme tips being fulvous; the feathers of the breast and lower parts are tipped whitish.

After the next moult the white edgings in this bird would disappear, and it would be in the dull blue brown-edged plumage of the adult winter dress.

Obs. The first writer on Indian ornithology who drew attention to the Blue Rock-Thrushes of the country was Col. Sykes, who described the species found in it as distinct, under the title of *P. pandoo*, alleging that it differed from the European bird in its smaller size, slighter form, brighter cærulean tint, want of orange eyelids and white tips to the feathers. As can be seen at a glance, however, these were individual peculiarities; and on further acquaintance with the species in India, Sykes's name relapsed into a synonym for the European bird, as did also, some years later, the *P. longirostris* of Blyth, founded on a Cashmere specimen.

It will not be necessary, in a local work such as this, to investigate the vexed question of the validity or otherwise of the eastern species, *M. solitaria*, a partly rufous form of the present. The subject has been ably treated by Messrs. Sharpe and Dresser in the 'Birds of Europe,' and by Mr. Hume in 'Stray Feathers.' It will suffice to state the case, and refer my readers to the exhaustive researches of these authors, should they wish to judge for themselves in the matter. From Eastern Bengal, through Burmah and Tenasserim, to the easternmost parts of China it is found that the males of the Blue Rock-Thrushes inhabiting that quarter of Asia assume a plumage which, in its perfect state, consists of a deep chestnut-colour from the breast to the under tail-coverts: they pass into this dress from the immature stage of the spring following their first moult, in which the blue feathers of the upper surface are pale-edged, and those of the throat dark-tipped; during the time this plumage is being acquired immature specimens are met with in every degree of advancement to the rufous coloration, while also mature examples, with a uniform blue upper plumage, are to be seen in every degree of diminution from the rufous dress—some having, for instance, only a small portion of the breast or abdomen thus coloured, while others may have no sign of it, except on the under tail-coverts, proving that the bird passes into the rufous stage, and then out of it as it gets fully adult. This character is not found in the females, for Mr. Hume can find no trace of it in a large series collected from Spain to Amoy.

It seems reasonable, I think, to assign the eastern form to the rank of a *local race* or *subspecies*, as in it alone, and not in the western, is found this peculiarity of coloration in the male bird.

Distribution.—The Blue Rock-Thrush is a migratory straggler to the hills of Ceylon, probably coming thus far south only during those years which witness an unusual stream to the Nilghiri hills and other elevated portions of Southern India. I have but to record two examples, both shot by a gentleman of the planting community who interests himself much in the birds of the island—Mr. Thos. Farr, of Maskeliya. The first was obtained in the vicinity of Kadugannawa during November 1872, and the second (one of a pair) on the Galloway-Knowe Estate, Nilambe, in March 1875; both were shot frequenting boulders beneath high precipices. This part of the Central Province, lying as it does to the westward of Kandy, is a district where an occasional migrant from India to our hills would naturally first lodge; but there are still more likely localities in the Kurunegala and Matale hills, where future research may prove that it locates itself during its short stay. That it does not wander far from those spots which are suited to its habits, and in which it first arrives, is evident on the testimony of one or two gentlemen who have described to me a bird, which can be no other than this species, frequenting the rocks in the same estate for a whole season. One of these instances occurred in the Knuckles, and another very close to where the first example above recorded was shot.

This Thrush is found throughout the whole of India in winter, arriving, according to Jerdon, about October, and retiring again in April. Regarding its distribution in the south, he writes that it is common in the Nilghiris in open and rocky ground, more rare in the Carnatic, very common in the Deccan and Central India, and abundant along the northern portion of the west coast, being likewise found in N.W. India, Cashmere, and the N.W. Himalayas. Additional evidence as to its localization in India is afforded by the writings of naturalists in 'Stray Feathers': Mr. Bourdillon says it visits the Travancore hills in small numbers; Mr. Fairbank remarks that it leaves the Deccan in March, and Khandala at the end of April. Mr. Ball writes that it is found near most of the large rivers in Chota Nagpur, and that he procured it in Singhbhum, Sirguja, and Hazaribagh. It is found throughout the Mt.-Aboo and Guzerat districts; and in Sindh, Mr. Hume writes,

it was by no means uncommon in the rocky hills that divide that province from Khelat, being abundant on the rivers flowing through these ranges; he likewise met with it on the Mekran coast and in Muscat.

It is, however, as I have stated, only a migrant to the East-Indian peninsula, and we must travel far to the north-west before finding its more permanent quarters. It is, in point of fact, chiefly found in the country bordering the Mediterranean both north and south, and is spread so entirely throughout Europe, that it occasionally visits Heligoland, and is stated to have been killed in Ireland in 1866. Captain Shelley frequently met with it in Egypt in April; and Von Heuglin considers it to be a visitor only in the spring and autumn months to that country, as also to Abyssinia and Arabia. It is common in Morocco and also in Andalusia on the Spanish side of the Straits, where Col. Irby says it is stationary. It is also found in Portugal. Further east, Mr. Basil Brooke says it is very common in Sardinia; and in Malta Mr. C. A. Wright testifies to the same fact. In South-eastern Europe it is a well-known bird, and spreads thence into Southern Germany, thence extending to the wonderful little bird-island of Heligoland.

Habits.—This species varies in its habits according to the locality it frequents. Its usual custom is, doubtless, as its name implies, to affect rocky places, boulder-strewn hill-sides, wild gorges, the stony banks of rivers, the vicinity of mountain-precipices, and other barren and inhospitable spots; and when thus met with is a shy and wary bird, manifesting a very restless disposition, flitting from rock to rock, and uttering a clear whistle as it takes flight on the approach of danger. Mr. Farr informs me that it displayed all these restless manners on both occasions when he met with it in the Ceylon hills. In parts of India, however (and the same is the case with the eastern variety), it is quite a familiar bird, " perching on housetops, feeding about stables, and frequently even entering verandahs, and sheltering itself during the heat of the day on beams and the eaves of houses." It is, in fact, writes Jerdon, supposed to be the Sparrow of the English version of the scriptures, " which sitteth alone on the house-top." Mr. Oates has a similar experience of it in Pegu; he says that " it is not unfrequently seen singly, more especially in the vicinity of wooden bungalows. At Thayetmyo one occasionally came into my compound for a day or so, and then suddenly disappeared for a month or two. It will flit into the verandah, sit on the post-plate, and remain for a few minutes in perfect silence." Mr. Elliot likewise noticed that it was very tame, often coming into houses and hopping about the verandah. It is usually a solitary bird, and feeds entirely on the ground on ants, Coleoptera, and various insects. Its song is said to be very sweet, and is commenced in India for some time before it leaves the country, not when feeding, but when it happens to have taken shelter during the heat of the day. It is caught in the Deccan and on the Bombay coast by the natives, and is much prized as a songster, being called by them the *Sháma*, which name, however, really applies to the Long-tailed Robin (*Cittocincla macrura*). Col. Irby, who publishes some interesting notes on its habits in the ' Birds of Gibraltar,' writes that it frequents daily the same spots, attracting considerable notice, both from its agreeable song and conspicuous habits. He further remarks, " The Blue Thrush very often perches on trees, and at Gibraltar and Tangier is frequently seen on the house-tops, though generally observed on bare rocky ground. It is sometimes found in wooded parts, if there are any high rocks; for instance, a pair nest at the first waterfall at Algeciraz, which is in the midst of a dense forest. It has a habit, in the courting-season, of flying straight out from a rock, and then suddenly dropping with the wings half shut, like a Wood-pigeon in the nesting-time. The Blue Thrush is very fond of ivy-berries and all fruit."

Lord Lilford writes :—" It is very omnivorous; literally, fish, flesh, fowl, and fruit I have seen it devour with apparently equal gusto, to say nothing of almost any insect."

Nidification.—This handsome Thrush breeds, as far as India is concerned, in the Himalayas, nesting in June. Capt. C. H. T. Marshall, who alone has taken the eggs in that country, records that the nest " was in a low stone wall, at no great elevation, and that it contained 4 eggs." Mr. Hume describes one of these, in ' Nests and Eggs,' as having a pale, slightly greenish-blue ground-colour, closely speckled at the larger end with very minute brownish-red spots; a few similar specks are sparsely scattered over the rest of the surface of the egg." It is very small for the size of the bird, measuring 1·0 by 0·73 inch.

RUBIGULA MELANICTERA
MYOPHONUS BLIGHI ♂ ♀

Genus MYIOPHONUS*.

Bill rather broad at the base, the tip somewhat lengthened and much decurved; rictal bristles much developed. Wings rounded, the 1st quill considerably lengthened, exceeding the shortest secondary; the 2nd, 3rd, and 4th graduated, and the 5th the longest. Tail-feathers lax. Tarsus long. Toes rather short.

MYIOPHONUS BLIGHI.

(BLIGH'S WHISTLING THRUSH.)

(Peculiar to Ceylon.)

Arrenga blighi, Holdsw. P. Z. S. 1872, p. 444, pl. xix.

Ad. sordidè cyanescenti-niger, uropygio et supracaudalibus rufescenti-brunneo lavatis: alis caudâque nigris, pennis omnibus dorsi colore extùs marginatis: tectricibus alarum minimis lætiùs cyaneis, plagam conspicuam exhibentibus: pileo toto, capitis lateribus et gutture toto nigerrimis: corpore reliquo subtùs dorso concolori, crisso et subcaudalibus rufescenti-brunneo lavatis: subalaribus pectori concoloribus: rostro et pedibus nigris: iride brunneâ.

Juv. brunneus, suprà saturatior brunneus, subtùs rufescentior: frontis, gutturis et pectoris plumis flavescenti-brunneo medialiter notatis: plagâ cyaneâ alari vix indicatâ.

Adult male and female. Length 8·0 to 8·5 inches; wing 4·2 to 4·4; tail 3·1 to 3·5; tarsus 1·4 to 1·5; mid toe and claw 1·25; bill to gape 1·25.

Iris brown; bill, legs, and feet black.

Entire head, throat, and hind neck coal-black (the feathers of the chin with spinous shafts), changing into dark cærulean blue on the interscapulars, back, scapulars, wing-coverts, chest, and breast, the basal portion of the feathers of these parts black; least wing-coverts and point of wing bright smalt-blue; wings and tail brownish black; quills obscurely edged with blue; upper tail-coverts and basal portion of rectrices edged chocolate-brownish; belly, lower flanks, and under tail-coverts edged with a lighter shade of the same, the basal portions of the feathers brown.

Female. The only example of this sex which has as yet been obtained was, Mr. Bligh informs me, similar to the male, but had the wing-spot lighter in colour, but at the same time of a brighter tint than in the male.

Young. An immature bird, figured in P. Z. S. 1872, pl. xix. fig. 2, is, writes Mr. Holdsworth, "brown, darker on the upper surface and more rufous below, the feathers of the forehead, throat, and breast centred with yellow-brown, and there is an indication of blue on the carpal joint."

Obs. This interesting Thrush is allied to *M. cyaneus* of Java, and forms one of the most noteworthy instances of the connexion, as regards some families, of the Ceylonese with the Javan avifauna. The South-Indian species (*M. horsfieldi*) has not nearly so much affinity with ours as the Javan bird. Blyth, with his wonted perspicuity, suggested, in his paper on Ceylonese birds (Ibis, 1867, p. 312), that *M. horsfieldi*, or a specialized representative of it, ought some day to be found in the island; and the value of his prophecy has been realized in the discovery of our handsome Whistling Thrush.

M. cyaneus is a larger bird than the present species. An adult male in the British Museum measures 5·8 and a female 5·4 inches in the wing; tail 3·0, tarsus 1·6, bill to gape 1·4.

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* This genus, on account of its rounded wing and lengthened 1st primary, almost merits being placed in a separate subfamily. Jerdon, indeed, places it in the *Myiotherinæ*, among which, however, he includes the Wrens and the Pittas, the latter not appertaining at all to the Thrushes. It will suffice, therefore, for the purposes of this work to keep *Myiophonus* among the Thrushes, particularly as Mr. Seebohm is now studying this group of birds with a view to giving the world a new classification of them in the 5th volume of the 'Catalogue of Birds.'

General plumage black; the hind neck, back, wing-coverts, and rump washed with hyacinth-blue; the centre portion of the feathers black; point of the wing deep hyacinth-blue; wings and tail black, the outer webs washed with blue; beneath black, washed with a darker blue than that of the back, except at the flanks, belly, and thighs, which are dull blackish; the bases of the feathers of the upper surface from the scapular region downwards, and of the under surface from the chest to the abdomen, are marked with a white lanceolate stripe; this character is not noticeable unless the feathers be raised.

An example of a male *M. horsfieldi* in the British Museum measures in the wing 6·3 inches. The species is very handsome. The lores and a frontal band are intense velvety black, while the head and the entire neck, chest, and interscapular region are jet-black; the outer webs of the wing-feathers are bright greenish blue, those of the tail a darker blue; least wing-coverts glistening smalt-blue; feathers of the breast and underparts with broad crescentic edgings of smalt-blue, of a deeper hue than that of the shoulder.

Distribution.—The present species, which is one of our rarest hill-birds, was discovered in 1868 by Mr. Samuel Bligh. He obtained it at an altitude of about 4200 feet, in forest on the banks of the Lemastota oya, which descends through the magnificent gorge below the Pite-Ratmalie Estate, Haputale, to the town of Lemas. Since that time he has procured one or two examples, and tells me that he has seen it several times, both in the Haputale and Kotmalie districts. In July 1870, Mr. Holdsworth procured a young bird near Nuwara Elliya; and in 1875 a male in fine plumage was shot by myself on the Badulla road, just above the Hakgala Gardens; finally, in December 1876 and in January 1877, Mr. Cobbold, of Maskeliya, obtained two male examples on the Maskeliya oya, a tributary of the Kelani, at about 3800 feet. In addition to the record of these few captures, I may mention that Mr. Forbes Laurie met with an individual on his estate at Kabragalla, near Nawalapitiya, at an elevation of about 3000 feet. This altitude is the lowest to which I have heard of it ranging; and I have no doubt it will be found in other forests of similar elevation throughout the coffee-districts; but I apprehend the jungles of the main range form its chief habitat. It is no doubt more common than such isolated captures would lead us to believe; but being a denizen of forest-clad mountain-gorges, which are mostly difficult of access, it has hitherto almost entirely escaped observation.

Habits.—The very shy nature of this handsome bird has doubtless conduced to its non-discovery until so recent a period. Mr. Blyth, in his note above quoted, remarked that a *Myiophonus*, or Whistling Thrush, was not a likely bird to have been overlooked; but, nevertheless, such was the case, for until late years the forests of the upper ranges had only been cursorily explored, and their most interesting novelties consequently remained to be discovered. It affects the vicinity of mountain-streams, and is very wary, keeping almost entirely to the shade of the thick forest, and only now and then showing itself on the rocks of the dashing torrent, where it will rest for a moment, piping out its "long-drawn, plaintive though loud, whistling note," or it will seize some looked-for morsel of food and then dart quickly out of sight. Its discoverer remarks that at such times it is very impatient of observation, and also that it appears to consort in pairs; this condition is, however, doubtless varied by the companionship of the yearling birds with their parents; and a brood of such probably combined to form a little troop of four which I met with at sunset on the occasion above mentioned. At this period of the day it exhibits the restless habits of the Thrush family by coming into the open and giving vent to its vocal powers, combined with a boldness apparently foreign to its nature; for the male which I procured at Hakgala sat whistling for some moments in an exposed tree by the roadside, and allowed me to dismount from my pony and shoot it! During the few minutes to which my observations were confined, the rest of the "family" flew hither and thither across the road, uttering a high sibilant whistle. It would likewise appear to wander occasionally from the shelter of the forest; for my friend Mr. Forbes Laurie tells me of one which he discovered beneath an umbrageous tree at the outskirts of a plantation, and which, when approached, took refuge under a coffee-bush, running in and out beneath the branches, and refused to depart until his coolies endeavoured to capture it by throwing a blanket over the shrub. Its food consists of various insects, Coleoptera, &c.; and in the stomach of my specimen I detected the bones of a frog, probably of the tree-frequenting genus (*Polypedates*). Mr. Holdsworth killed his specimen on the low branch of a tree near a mountain-stream.

It is much to be feared that the extensive felling of the forest for tea-planting, in the upper ranges, will limit within the smallest possible bounds the portion of country in Ceylon alone fit for the habitation of this species, and may possibly conduce to its ultimate extinction.

Nidification.—Nothing of any certainty is known of the nesting of the Whistling Thrush; but I am inclined to the belief that several nests which I have found on the banks of streams belonged to it. They resembled those usually constructed by this family, and were deep ample cups, composed almost entirely of moss and fine roots, fixed in niches, in overhanging trees, or in forks of saplings at some height from the ground.

The figures in the Plate accompanying this article are those of a male shot by myself near Hakgala, and of a young bird procured by Mr. Holdsworth near Nuwara Elliya.

PASSERES.

Fam. BRACHYPODIDÆ.

Thrush-like birds of *arboreal* habit, mostly frugivorous in diet, with the legs and feet short.

Bill variable, in most Thrush-like. Wings with the 1st quill not less than half the length of the secondaries. Tail of 12 feathers, and shorter than the wing.

Subfam. IRENINÆ*.

Bill very wide, the mandibles inflated; both culmen and commissure curved, the tip slightly hooked and notched. Nostrils round, perforated in a deep indentation, and protected by well-developed bristles. Rictal bristles small. Wings somewhat pointed, the 4th and 5th quills the longest, the 3rd equal to the 7th. Tail even. Legs and feet proportionately very short. Tarsus slightly exceeding the middle toe; the outer toe connected with the middle at the base as far as the 1st joint of the latter.

Nape furnished with long hairs. Sternum narrowed in front and widening considerably towards the posterior edge, which is indented with a wide notch close to the sides.

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* I have placed this singular and interesting group of birds first in the family of Brachypodidæ because, as a sub-family possessing some abnormal characteristics, they are better in this position than following the Phyllornithinæ, with which they have nothing in common except the very superficial character of a partial blue coloration. That the *Irenas*, with their arboreal and frugivorous habits, their Brachypodine legs and feet, and wing- and tail-formation, belong to the short-legged Thrushes is the opinion of many able ornithologists. They were placed, through an oversight, in the Dicruridæ by Mr. Sharpe, and he now informs me that he considers them to have affinities with the Bulbuls. Mr. Hume argues, on the evidence afforded by their peculiar eggs, that they are not well placed in this position, and suggests that they will have to be located between the Paradiseidæ, Sturnidæ, and Icteridæ. Their totally different wings would, in my opinion, remove them far from the Starlings, and to the Birds of Paradise they possess only a rostral resemblance.

Genus IRENA.

Characters the same as those of the subfamily, of which it is the only genus.

IRENA PUELLA.

(THE FAIRY BLUEBIRD.)

Coracias puella, Latham, Ind. Orn. i. p. 171 (1790).

Irena puella (L.), M'Clell. P. Z. S. 1839, p. 160; Jerdon, Cat. B. S. India, Madr. Journ. 1839, x. p. 262; Blyth, Cat. B. Mus. A. S. B. p. 214 (1849, in pt.); Layard & Kelaart, Cat. B. Prodromus, App. p. 58 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 130; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 273 (1854); Jerdon, B. of Ind. ii. p. 105 (1863); Walden, Ibis, 1871, p. 170; Holdsworth, P. Z. S. 1872, p. 452; Ball, Str. Feath. 1873, p. 71; Hume, Nests and Eggs, ii. p. 298 (1874); id. St. Feath. 1874, p. 226, et 1875, pp. 130, 325; Armstrong, ibid. 1876, p. 326; Sharpe, Cat. B. iii. p. 268 (1877); Fairbank, Str. Feath. 1877, p. 406; Hume & Davison, ibid. 1878, p. 328.

Irena indica, A. Hay, J. A. S. B. 1846, xv. p. 170.

Irena, sp.?, Kelaart, Prodromus, Cat. p. 124 (1852).

The Fairy Roller, Latham. *Nil rajah kurulla*?, Sinhalese.

Adult male and female (Andamans). Wing 5·0 inches; tail 3·85 to 4·2; tarsus 0·7 to 0·75; mid toe 0·6, claw (straight) 0·27; bill to gape 1·15; under tail-coverts falling short of the tip of the tail by 1·5.

Adult male (Ceylon, Poole collection). Wing 5·0 inches; tail 4·0.

Dr. Armstrong gives the measurements of Burmese examples in the flesh as:—Length 9·75 to 10·3 inches; wing 4·8 to 5·2; tail 3·75 to 4·25; tarsus 0·78 to 0·85; bill to gape 1·1 to 1·2.

"Iris light reddish brown, in a female deep red; bill, legs, feet, and claws black" (*Armstrong*).

Male. Top of the head to within one eighth of an inch of the culmen and the eyes, nape, back of neck, entire back, upper and under tail-coverts, sides of the rump, scapulars, lesser wing-coverts, and tips of the greater coverts glistening lazuline blue, mostly pervaded with a purplish hue, except on the head; rest of the plumage deep black, less intense on the wings and tail; the inner webs of the quills brownish black. At each side of the nape there are several lengthened hairs.

Female. Above and beneath a dull greenish or Prussian blue, brightening on the upper and under tail-coverts; the tips of the feathers are brighter than the central portions; the shafts of the feathers blackish; primaries, secondaries, and greater coverts blackish brown, the primaries edged with blue, and the inner secondaries washed with the same; central tail-feathers blue, and the remainder blackish brown, the innermost edged outwardly with blue; lores blackish, the ear-coverts duskier than the surrounding parts.

Obs. Layard's Ceylonese specimen corresponds entirely with an Andaman example in my collection, and the latter is identical with Indian ones. The Malaccan form (*I. cyanea*) differs from the Indian solely in the shorter tail, but equally long upper and under tail-coverts, causing a diminution of the distance between the tips of the coverts and those of the rectrices. *I. cyanea* measures in the tail 3·5 inches, and the upper tail-coverts fall short of its tip by about 0·9 inch, while the lower approach to within less than half an inch of it. The race inhabiting the more southerly region comprised of Labuan, Borneo, and Sumatra has the tail shorter still, about 3·2 inches, and the

under tail-coverts are produced in some examples quite to the tip of the tail. It has been named *I. criniger* by Mr. Sharpe, on account of the nuchal hairs, which are very prominent. Some Malayan examples of *I. cyanea* seem to form a link with this Bornean race, for the late Lord Tweeddale instances one in which the lower tail-coverts only fall short of the tips of the rectrices by $\frac{1}{8}$ inch. The Javan bird has been separated as another species, *I. turcosa*, by the last-named author, on account of the paler or more silvery tint of the blue colour; the under tail-coverts likewise reach to the end of the tail.

Distribution.—The extreme rarity of this species as a Ceylonese bird fosters the belief that it is a visitant to the island from the south of India. It could scarcely be a resident form, as it has very seldom been met with, and during all my wanderings in the timber-forests of the south and west I never saw a sign of it. Layard obtained a specimen near Kandy, which is still extant in the Poole collection, and Kelaart procured a second in the same district. Subsequently it has been met with in Saffragam, where the forest is usually lofty and luxuriant and eminently suited to its nature. For information of its existence in this district I am indebted to Mr. Hart, the taxidermist of the Colombo Museum, who met with a small flock in the neighbourhood of Rakwana in 1868, and still more recently near the same place in November 1877. On the last occasion three or four were observed perched on the summit of a lofty tree, out of which one was procured. I have no data concerning the season of the year in which the other examples were met with, and therefore it is still a matter of uncertainty whether it is migratory or not. On the mainland it is found in the lofty forests of Malabar, Travancore, the Nilghiris, and the Palanis. In the latter district Dr. Fairbank procured it at an elevation of 3500 feet, and observed it from the base of the range up to 4000 feet; he likewise notes it as an inhabitant of the Sawant-Wade woods in the Khandala district. Jerdon says that it is far from uncommon in the lofty jungles of Malabar, and remarks that he met with it in forest near Palghautcherry, Trichoor, the Wynaad, and on the Coonoor Ghât as high as 4000 feet and upwards. It does not seem to have been noticed anywhere between the Khandala district and the sub-Himalayan region. In the latter it is known at Sikhim. Captain Butler speaks of a specimen in the Frere-Hall collection at Kurrachee, stated to have been procured at Sehwan in Sindh; but Mr. Hume suggests that, this locality being totally out of the range of the species, the bird must have escaped from captivity. Continuing, however, to trace out its range from Sikhim eastwards, we find it in Cachar, where Mr. Inglis says it is not rare, and further to the south in Burmah it is far from uncommon. Mr. Oates writes that it is extremely abundant in all the evergreen forests on the eastern slopes of the Pegu hills, but that it is never seen on the western slopes or on the plains. Dr. Armstrong states that it occurs sparingly at China-Bakeer, but is extremely abundant "at Syriam, where, in the early mornings, large flocks of these birds may be found feeding amongst the different fig-trees in the neighbourhood." Extending to the south we find it in Tenasserim, common throughout the evergreen forests, rare in the north, and very abundant in the south of the Province. How far down the peninsula the typical *I. puella* extends does not appear yet to be known; but it is probable that it merges very soon into the Malayan race, for Mr. Hume testifies to the Mergui (South Tenasserim) specimens being already intermediate between the two.

Habits.—The Fairy Bluebird associates in small parties and affects lofty trees in foliage, feeding on their fruit. It is entirely a fruit-eating bird, and in this respect shows its affinity to the rest of the short-legged Thrushes (Brachypodidæ). It is never found, says Mr. Davison, in the deciduous forests of Tenasserim; the tenacious manner in which it confines itself to the evergreen jungle is remarkable, for he writes, "About Pappoon, where the forests are deciduous, I never saw one; but, again, about twenty miles to the north of that place, the bird reappears with evergreen forests." The constantly recurring supply of food in the latter naturally accounts for the predilection of the Bluebird for them; but it is strange that when deciduous woods are found in their vicinity it does not wander through them during the season of fruition. Mr. Davison writes:—"It is almost always found in flocks, but occasionally in pairs or even singly. It is a very bright and lively bird, always on the move, hopping from branch to branch or flying from tree to tree, uttering its fine note, which resembles exactly the words 'be quick, be quick.' They live on fruit, I believe, exclusively, and are especially fond of figs; and where a fig-tree is in fruit great numbers congregate, with Hornbills, Green Pigeons, Fruit-Pigeons, and numbers of other fruit-eating birds. In the middle of the day

they habitually come down to the banks of streams and the smaller rivers to drink and bathe." Jerdon styles its note "a fine mellow warble, which it is constantly repeating, both when feeding and as it flies from one tree to another."

Nidification.—This lovely bird breeds in the forests of Southern India in the early part of the year. Through the researches of Mr. Bourdillon the particulars of its nidification have been made known. He found it nesting some years ago in a sappling about 12 feet from the ground; the nest was a loose sparsely built structure composed of "dead twigs lined with leaves, and was about 4 inches broad." More recently he has found others, concerning which Mr. Hume sends me particulars *in epist*. One was, writes Mr. Bourdillon to Mr. Hume, in "a pollard tree beside a stream among some thick branches about 20 feet from the ground; the nest was neatly but very loosely constructed of fresh green moss, which formed the bulk of it, and was lined with the flower-stalks of a jungle shrub. It was very well concealed, and was about 4 inches broad, with a cavity not more than 1½ inch deep." Another nest was situated about 10 feet from the ground and was composed of twigs without any lining. The number of eggs seems invariably to be two. They are regular or elongated ovals; the shell is fine and close-grained, but not very glossy. The ground-colour is pale green, and they are streaked and blotched with pale dull brown or reddish brown. In one specimen they are "almost entirely confluent over the large end (where they appear to be underlaid with dingy, dimly discernible, greyish blotches), and from the cap thus formed they descend in streaky mottlings towards the small end, growing fewer and further apart as they approach the latter, which is almost devoid of markings." In others, he writes, the markings are pretty thick, even at the small end. The eggs average in size from 1·05 to 1·15 inch in length by 0·71 to 0·81 inch in breadth.

PASSERES.

BRACHYPODIDÆ.

Subfam. PYCNONOTINÆ.

Bill straight; the culmen curved; mandibles compressed towards the tip, which is distinctly notched. Nostrils basal, placed in a capacious membrane; rictal bristles well developed; nape furnished with hairs. Wings somewhat rounded, the secondaries lengthened. Tail shorter than the wings. Legs and feet typical in their shortness.

Genus HYPSIPETES.

Bill long, commissure straight for the greater part, culmen but slightly curved. Nostrils long, protected by bristles, and with a tuft of feathers at the base; rictal bristles stout and not very long. Wings with the 1st quill very short, and the 4th the longest or equal to the 5th. Tail long and square at the tip. Legs short. The tarsus shorter than the middle toe and claw. Nuchal hairs lengthened.

HYPSIPETES GANEESA.

(THE BLACK BULBUL.)

Hypsipetes ganeesa, Sykes, P. Z. S. 1832, p. 87; Jard. & Selby, Ill. Orn. 2nd ser. pl. 2; Blyth, Cat. B. Mus. A. S. B. App. p. 339 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 255 (1854); Jerdon, B. of Ind. ii. p. 79 (1863, in part); Blyth, Ibis, 1865, p. 42; Holdsw. P. Z. S. 1872, p. 450; Hume, Str. Feath. 1876, p. 400; Fairbank, ibid. 1877, p. 405.

Hypsipetes nilghiriensis, Jerdon, Cat. B. S. India, Madr. Journ. 1839, x. p. 245; Blyth, Cat. B. Mus. A. S. B. p. 207 (1849); Kelaart, Prodromus, Cat. p. 123 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 125; Jerdon, B. of Ind. ii. p. 78 (1863, in pt.); Hume, Nests and Eggs, ii. p. 280 (1874); id. Str. Feath. 1873, p. 438.

The Nilgherry Black Bulbul and *The Ghât Black Bulbul* (Jerdon).

Kele kondiya, Sinhalese.

Male. Length 9·6 to 10·5 inches; wing 4·5 to 4·9; tail 4·3; tarsus 0·8; mid toe and claw 0·85 to 0·9; bill to gape 1·35.

Iris faded red or orange, with a dusky tinge; bill coral-red, the nostril-membrane brown; legs and feet yellowish red, the claws blackish (these latter fade in dried specimens).

Lores, forehead, head, and nape glossy black, with a greenish lustre in freshly moulted birds; hind neck, back, rump, and upper tail-coverts dull bluish slate, the centres of the back-feathers dark; wings and tail dull brown, the wing-coverts, secondaries, innermost primaries, and tail-feathers at their bases edged with bluish ashy, the latter faintly so; cheeks and ear-coverts cinereous brown; chin darkish; throat, chest, and under surface faded slate-grey, paling on the abdomen; under tail-coverts slaty brown, with dark shafts and whitish edges.

Adult female. Length 9·6 inches; wing 4·4; tail 3·6; tarsus 0·7; bill to gape 1·2.

Iris, in some examples I have examined, slightly brownish.

Plumage similar to that of the male.

Young. Birds of the year have the tip of the bill and space round the nostril blackish; iris yellowish brown; legs and feet dusky yellowish.

Throat and under surface lighter than in the adult; wings and tail browner, or of a paler hue than in old birds; the quills deeply margined with pale tawny, and the edges of the tail-feathers slightly coloured with the same.

Obs. This bird has been known under two names—*H. ganeesa* of Sykes and *H. nilghiriensis* of Jerdon. The former author described his type from the Ghâts, and birds from that region were accordingly kept as *ganeesa*; while those from the Nilghiris were separated by Jerdon under the above-mentioned specific name, which he likewise applied to the Ceylonese race. Blyth pointed out (Ibis, 1865) the identity of the two forms; and Mr. Holdsworth accordingly applied Sykes's title to our birds. I cannot do better than subjoin Mr. Hume's note on this subject, written after he had fully satisfied himself that these two supposed species were one and the same. He writes (Str. Feath. 1876, p. 400):—"I have carefully compared seven specimens from Mahabaleshwar with nine from the Nilghiris, three from the Assamboo hills, and four from Ceylon. I find that adults and young birds from the three former localities are precisely similar; in the younger birds the bills are browner and the wings smaller, but there is no difficulty in matching any Mahabaleshwar bird with some Nilghiri one. Birds from Ceylon are, in all respects but one, identical with those from the other localities; but they certainly do appear to have somewhat larger bills. I entertain no doubt that the birds from all these localities should henceforth stand under Sykes's name of *ganeesa*." Blyth noticed a peculiarity in the Ceylon birds in that they were paler than those from South India. I have compared Ceylonese specimens with some from the Bombay district and Madras Presidency, and find scarcely any appreciable difference, except, perhaps, in the throat and flanks, which, in the Indian examples, are somewhat darker than in ours. A bird from Matheran measures 4·4 inches in the wing, and 1·21 in the bill from gape to tip.

The dimensions of an example shot by Mr. Fairbank in the Palanis are:—Length 9·5 inches; wing 4·6, expanse 14·0; tail 4·0; tarsus 0·75; bill to gape 1·1. Iris hazel, dyed with lake-red.

This species is allied to the northern form, *H. psaroides*, which differs in being generally paler, and more particularly as regards the lower parts and outer webs of the wing-feathers; the under tail-coverts are very broadly margined with white, and it is likewise a larger bird. The wings of 7 specimens in the national collection vary from 4·8 to 5·1. It inhabits Bengal and the sub-Himalayan region.

Mr. Hume has lately described an allied species to this latter, which inhabits the Tenasserim hills, as *H. subniger*. It is smaller and everywhere much darker, with the interscapular region black. Males—length 8·5 to 8·9 inches, wing 4·5 to 4·85.

Distribution.—The Black Bulbul is found throughout all the low country of the southern half of the island, wherever there is forest or wild secondary jungle, particularly that growing on the sides of moderately-sized hills. It is especially abundant in the interior of the Western Province, where the hills are well wooded, as in many parts of the Raygam and Hewagam Korales; in Saffragam it is extraordinarily numerous, swarming in the Peak forests and ascending to the highest elevations in it. In the Pasdun Korale and the south-western hilly districts it is very common, extending into the Morowak and Kolonna Korales. It is also found throughout the Kandyan districts, and in the dry season frequents the upper forests in the main range and on the Nuwara-Elliya plateau. In the higher parts of Uva it is always stationary. As regards the forests of the northern half of the island, it may be said to wander about in them, being found here and there when perhaps little expected. I have seen it near Trincomalie during the north-east monsoon, and also in other localities between that station and Anaradjapura. From this latter place, and also from the forests near Puttalam, it is not recorded by Mr. Parker in the lists furnished to me by him, but it probably occurs in both.

This species does not enjoy a wide distribution on the mainland, though it is very numerous in the southern hilly portions of the peninsula. It abounds, says Jerdon, on the summit of the Nilghiris from 6000 to 8000 feet, and likewise frequents the district of Coorg. It extends along the Western Ghâts to the Mahabaleshwar hills, where Col. Sykes first procured it, the dense woods of that region being given by him as its habitat. Mr. Fairbank remarks that it is rarely found on the Mahabaleshwar plateau, though it is abundant on the Goa frontier; he found it on the tops of the Palanis and on the lower hills, and Mr. Bourdillon speaks of it as being very abundant at higher elevations on the Travancore hills, but less so at their base. It is likewise found on the Assamboo hills.

Habits.—This large Bulbul frequents forest, jungly ravines, steep woods, and most places in which there are large trees. It is a sociable and very restless bird, extremely noisy and lively in its movements, and possessing, for a Bulbul, very varied notes. Out of the breeding-season it congregates in vast flocks to feed on certain fruits, and, dashing about from tree to tree with loud notes, and with apparently no other object than that of chasing its companions for amusement, it fills the forest with a ceaseless din, completely drowning the voices of all other birds. Among its various notes is one frequently uttered when in company, resembling the sound *tchēē*, and another, a call-note, which may be likened to the syllables *zū-kink up, zū-kink up*, repeated several times, and nearly always given forth when alone, either on the wing or feeding. Its usual harsh warble, so well known to those who have frequented the forests in the south and west of Ceylon, is uttered from the tip top of a high tree, to which the bird, with some show of good sense, invariably mounts when it desires to make itself heard! Its diet consists of fruits, seeds, and berries; and when many trees are in bearing in the same spot, all the Black Bulbuls in the neighbourhood flock to them in great numbers: it, however, also feeds upon insects; and I have observed it dart occasionally at them from its perch, although its usual manner of capturing them is to seize them from the branches of trees, to which it will sometimes cling after the manner of a Tree-creeper.

Concerning its economy in India I find the following observations:—Jerdon writes that it lives in small flocks in the dense woods, feeding on various fruits and berries, usually on the tops of trees; it keeps up a lively and agreeable warbling, which it often continues during its occasional flight from one tree or patch of wood to another. Its flight is undulating, easy, and rapid. Mr. Bourdillon finds that they are gregarious and very noisy, apparently preferring the tops of trees, though they also feed on the berries &c. found in secondary jungle. Mr. Fairbank noticed that they only assembled in flocks during the month of June.

Nidification.—In the western parts of the island this species breeds from January till March, building its nest on a horizontal bough or in the fork of a lateral branch at a considerable height from the ground. It is a compact, though rather untidy-looking structure, made of dead leaves, roots, and moss, and lined with fibres and "bents." The eggs are normally two in number, of the usual ovate shape characteristic of Bulbuls; ground-colour white, spotted and speckled with reddish brown, somewhat confluent at the obtuse end. Axis 1·0 to 1·05, diameter 0·72 to 0·73 inch.

In India it breeds, according to the experience of several observers, from March until June, laying two eggs. Mr. Davison writes, "The nest is generally placed from 12 to 20 feet from the ground, in some dense clump of leaves; favourite sites are the branches of parasitic plants with which nearly every acacia, and, in fact, nearly every other tree about Ootacamund, is covered. The nest is composed exteriorly of moss, dry leaves, and roots, lined with roots and fibres." Mr. Wait writes of its nest, as made at Coonoor, that it is neatly and firmly made, composed chiefly outside of green moss, grass-stalks, and fibres; while inside it is lined with fine stalks and hairs; the cavity is from $2\frac{1}{2}$ to 3 inches in diameter, and about half that depth. The ground-colour of the eggs, says Mr. Hume, varies from white to delicate pink. The markings consist of different shades of deep red and pale washed-out purple, which in some eggs are bold, large, and blotchy, and in others minute and speckly, and in both forms there is a tendency to form an irregular zone round the large end; the shell has commonly little or no gloss, and is very fragile. The eggs vary from 1·0 to 1·17 inch in length by 0·7 to 0·8 in breadth.

Genus CRINIGER.

Bill stout, much shorter than in *Hypsipetes*, moderately curved, the tip notched. Nostrils linear, protected by fine bristles; rictal bristles moderate. Wings with the 4th and 5th quills equal and longest. Tail rather long, broad, wider at the tip than at the base. Legs and feet small. Tarsus about equal to the middle toe and claw.

Nuchal hairs more numerous than in the last genus.

CRINIGER ICTERICUS.

(THE FOREST BULBUL.)

Criniger ictericus, Strickland, Ann. & Mag. Nat. Hist. 1844, xiii. p. 411; Kelaart, Prodromus, Cat. p. 123 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 124; Jerdon, B. of Ind. ii. p. 82 (1863); Legge, J. A. S. (Ceylon Branch) 1870–71, p. 43; Holdsworth, P. Z. S. 1872, p. 450; Hume, Nests and Eggs, ii. p. 282 (1873); Legge, Ibis, 1874, p. 20, et 1875, p. 396; Bourdillon, Str. Feath. 1876, p. 400.

Pycnonotus ictericus, Blyth, J. A. S. B. 1844, xiv. p. 570.

Hemixos icterica, Blyth, Cat. B. Mus. A. S. B. p. 207 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 250 (1854).

The Yellow-browed Bulbul (Jerdon).

Male. Length 8·0 inches; wing 3·7; tail 3·3; tarsus 0·72; mid toe and claw 0·75; bill at front 0·7, to gape (straight) 0·82.

Iris light red, or red; bill black; legs and feet bluish leaden or dusky slatish.

Lores and at the base of nostril, supercilium, face, throat, and entire under surface, under tail- and under wing-coverts, with the basal portion of the inner margins of the quill-feathers and tertials, sulphur-yellow; the face, side of throat, and flanks shaded with the hue of the back; entire upper surface olive-green; inner webs of quills brown, the shafts dark brown; inner margins of all but central rectrices yellowish, the shafts are brown above and yellow beneath.

Female. Length 7·75 inches; wing 3·3 to 3·5; tail 3·1.

The yellow in front of the eye is confined to the lores; the under surface slightly duller, the face duskier than in the male.

Young. Birds of the year have the cheeks faintly barred brownish, and the flanks generally somewhat darker than adults.

Obs. Indian specimens of this bird that I have examined measure as follows:—S. India—wing 3·5 inches, tail 3·3; S. India—wing 3·6, tail 3·4; Coorg—wing 3·6, tail 3·5. Size of bill and plumage identical with Ceylonese examples.

The nearest Indian ally to our bird is the northern form *C. flaveolus*, Gould. An example in the national collection from Nepal has the head dull rusty brown, the feathers elongated; lores, forehead, chin, and throat greyish white; back greenish yellow, with a rusty tinge; wings and tail rusty brown; chest and under surface dull yellowish: wing 4·1. As showing, however, the singular affinity of the Malayan avifauna with that of Ceylon we have a much more closely related species in the *C. simplex*, Kuhl, of the Malay islands. This species has the upper surface almost of the same tint as in our bird; the throat and under surface dull yellow, suffused with olive-greenish on the sides of the chest and flanks; it wants the yellow lores and face, which parts are duskier than the head. Wing 3·5 to 3·7.

Distribution.—This fine Bulbul is widely diffused throughout the island, restricting itself to forests and heavy secondary jungle, in which it is a common bird. It is essentially a denizen of timber-jungle, for though it is not found in the cultivated portions of the Western Province, directly the forests in the Hewagam, Raygam, Three and Four Korales are entered it at once forces itself upon the acquaintance of the naturalist. In the Pasdun Korale, throughout Saffragam, in the south-west (beginning as near the sea as Kottowe and Baddegama), and in the Morowak and Kukkul Korales it is a common bird. It is scattered throughout all the northern forests, but does not apparently inhabit the Jaffna peninsula, for the simple reason that there is no heavy jungle on it. In the wilds of the Eastern Province, and in the forest along the rivers flowing through the Park country and the district lying to the south of Haputale, it is also found. As regards the

Kandyan Province, it is a common bird in the forests up to an altitude of 3500 feet, and in the "Knuckles," and on the slopes of the main range and the Peak wilderness, ascends to a greater elevation than this, but does not, as far as I am aware, inhabit the immediate neighbourhood of Nuwara Elliya. In Uva it is very numerous, affecting even little patches of jungle on the patna-streams.

Those who have not collected much in the heavy forests of the low country have but little idea how common a bird this Bulbul is in the particular localities which suit its habits. Kelaart wrote that it was a common species in the low country; but Messrs. Layard and Holdsworth have taken exception to this statement, inasmuch as they had not perhaps met with it themselves. Layard infers that Kelaart spoke of *Ixos luteolus*, and it is possible that there may have been such misidentification; but nevertheless, as I have shown, it is a common bird in all the *forests* of the low country; had Kelaart written of it, "common in the low-country *forests*," his statement would have been beyond criticism.

As regards the mainland, this species has only been found in the peninsula, and its range does not appear to extend further north than Bombay. Dr. Fairbank, who records it as common on the Goa frontier and rarely found on the Mahabaleshwar plateau, remarks that it may extend along the strip of country which, with similar conditions of climate and food, reaches as far up the west coast as Surat. Mr. Bourdillon states that it is a common bird in the Travancore hills, and in the Palanis it is said to inhabit an elevation of 4000 feet and upwards. Jerdon writes that it prefers mountainous regions at from 3000 to 5000 feet, being abundant on the slopes of the Nilghiris at that altitude, although it is also occasionally found "at a few hundred feet above the sea-level."

Habits.—No bird that I am acquainted with appears to be more at home in the solitude and shade of the forest than the present. It is often met with associating in a little party far from the proximity of other species, hopping actively about among the boughs of lofty trees or in the luxuriant sapling growth beneath them, in which it finds no lack of insect-food, and, during the time that it is partaking thereof, testifies to a happy existence by frequently flying on to some bare branch, to give out its quiet little warble and then resume its sociable fellowship with its companions. I have always found it in the society of one or two of its fellows, the little troop thus formed exhibiting a most restless character: their sombre-coloured backs and wings and perpetual movement make it difficult to discern them among the foliage, although they may be heard warbling close at hand; and it not unfrequently happens that, when the jungle is at all thick, they disappear without being detected, notwithstanding that the branches around have been diligently scrutinized in the search for them. They do not, as a rule, keep to the tops of trees, but usually hunt for their food in lateral branches or on the upper boughs of saplings. Their low-toned varying notes are difficult to describe, but, on the whole, form a not unpleasing little warble. Some of them resemble the sounds *clȳ eye, te white up, te whit up*, which three modulations are continuously repeated for no little space of time. I have found its food to be more insectivorous than frugivorous; but in India it is said of it that the latter condition chiefly obtains. Mr. Bourdillon writes that it wanders "about in small flocks, feeding almost entirely on fruits and seeds." Jerdon says of it, in the Madras Journal Lit. and Sci. x. p. 249, "In all specimens I have examined I have found fruit only in its stomach; but, from the strong bristles at the base of the bill, I suppose it may, at certain seasons, partake of insects."

Nidification.—I once found the nest of this bird in the Pasdun-Korale forests in August; little or nothing, however, is known of its breeding habits in Ceylon, so that it most likely commences earlier than that month to rear its brood. My nest was placed in the fork of a thin sapling about 8 feet from the ground. It was of large size for such a bird, the foundation being bulky and composed of small twigs, moss, and dead leaves, supporting a cup of about $2\frac{1}{2}$ inches in diameter, which was constructed of moss, lined with fine roots; the upper edge of the body of the nest was woven round the supporting branches. The eggs were two in number, of a reddish-white ground-colour, rather thickly freckled throughout with sienna, and forming a well-marked zone round the obtuse end. They were broad, rather stumpy ovals, and measured 0·97 inch in length by 0·70 inch in breadth. The situation of this nest was near a stream in the forest; and many other old ones, which, I believe, belonged to this species, were in similar spots. Mr. Hume, in his 'Nests and Eggs,' remarks that some eggs which he received had "only the faintest trace of pale pinkish mottling towards the large end,"

while others were "thickly freckled all over, most densely at the large end, with salmon-pink or pale pinkish brown," showing that they are subject to considerable variation in colour.

Naturalists quoted by Mr. Hume speak of the nest being "suspended by the outer rim to two branches," or "attached to twigs by cobwebs," and never placed in a fork. My experience (and I have no doubt about my identification) tends to show that it does build at times like other Bulbuls. The bottom of the nest was *in the fork*.

Genus IXOS.

Bill stouter, wider at the base, and less compressed at the tip than in *Criniger*. Wings shorter, less pointed, with the 5th and 6th quills subequal and longest. Tail not so broad and less square at the tip. Legs and feet stout. The toes strongly scaled; lateral toes equal; claws rather short. Nuchal hairs lengthened, but scanty.

IXOS LUTEOLUS.

(THE WHITE-EYEBROWED BULBUL.)

Hæmatornis luteolus, Less. Rev. Zool. p. 354 (1840).

Pycnonotus flavirictus, Strickl. Ann. & Mag. Nat. Hist. 1844, xiii. p. 413; Blyth, J. A. S. B. 1845, xiv. p. 567; id. Cat. B. Mus. A. S. B. p. 210 (1849); Kelaart, Prodromus, Cat. p. 123 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 124 (*flaviriatus* errore).

Pycnonotus luteolus, Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 243 (1854).

Criniger tickelli, Blyth, J. A. S. B. 1845, xiv. p. 571.

Ixos luteolus, Jerdon, B. of Ind. ii. p. 84 (1863); Holdsw. P. Z. S. 1872, p. 450; Hume, Nests and Eggs, ii. p. 283 (1874); Ball, Str. Feath. 1874, p. 410, et 1876, p. 235; Fairbank, ibid. 1877, p. 405.

The Yellow-bellied Bulbul, *The White-browed Bush-Bulbul* in India; *The Cinnamon-Thrush* (Europeans in Ceylon). *Poda-pigli*, Telugu; *Pastro kondache*, Portuguese in Ceylon. *Guluguluwa*, Sinhalese.

Adult male and female. Length 7·4 inches; wing 3·1 to 3·3; tail 3·0 to 3·2; tarsus 0·8 to 0·95; mid toe and claw 0·8; bill to gape 0·8 to 0·9.

Iris variable, rust-colour, dull red, or blood-red; bill black; legs and feet dusky-leaden blue or plumbeous.

Above olivaceous brown, the edges of the feathers obscure greenish; on the head the centres of the feathers are brown, edged with greyish, below the eye and a broad stripe from nostril above it white, with a dark brown dividing line above the lores; quills and wing-coverts edged with greenish; the tail the same but duller, the exterior feathers tipped with yellowish grey; shafts reddish brown; ear-coverts brownish; beneath whitish, washed with brownish on the chest, and becoming yellowish on the lower breast and abdomen; vent, under tail-coverts, and under wing-coverts pale sulphur-yellowish, showing rather conspicuously beneath the carpal joint. Some examples have the feathers of the chest more markedly edged with yellowish than others.

This Bulbul is in a constant state of moult, affecting its plumage chiefly at the back of the neck, which part is often quite bare.

Young. Iris not so bright a red as in the adult. Plumage similar.

Obs. Two examples from South India measure in the wing 3·3 and 3·4 inches respectively: one is identical with Ceylonese specimens, the other is tinged with rusty; the throat and vent are more tinged with yellow than in my examples of our bird.

Another *Ixos* from South India, found on the Eastern Ghâts, is *I. xantholæmus*, Jerdon, the "Yellow-throated Bush-Bulbul." It has the head, face, and occiput dusky yellowish green, the chin and throat yellow; hind neck and back ashy grey; wings and tail hair-brown, the margins of the feathers greenish; under surface pale brownish grey, under tail-coverts yellow. An example in the British Museum measures in the wing 3·15.

A more closely-allied Bulbul to *I. luteolus* is *I. analis* from Java. It has very much the appearance of our bird, but the lores and a ring round the eye are black, the supercilium is very broad and spreads at the back of the eye over the face and ear-coverts; the brown of the upper surface is more ruddy than in *luteolus*, and the tail-feathers not margined with greenish; throat whitish buff; under tail-coverts and vent yellow; the under surface greyish, the centres of the feathers on the chest brown. The wings of examples in the national collection measure from 3·4 to 3·5 inches. I instance this species to show, as in the case of *Criniger simplex*, how nearly allied the avifauna of Java is to that of Ceylon.

Distribution.—This soberly-clad and familiar bird is one of the commonest and best-known species in Ceylon; it is very abundant in most parts of the low country both in the north and south of the island, and is especially so in the maritime districts. In the low jungle-covered tracts round the whole of the north

coast and in the scrubs bordering the south-eastern shores it is as numerous as on the western sea-board. In the interior it is almost everywhere to be met with, whether in the semicultivated country between Colombo and the Kandyan hills, the forests of the northern half of the island, or the similarly interminable jungles of the Eastern Province. In the south-western hill-region it chiefly frequents the open and partially cultivated tracts of country; but it is also found in wooded places, particularly in secondary jungle, where the forest has been, at some time or another, cut down by the natives. In the Kandyan province it is common in Dumbara and the surrounding neighbourhood up to an elevation of about 2500 feet; but in the eastern district of Uva I have observed it much higher, for in that part it frequents the patna-scrubs which clothe the hills between Fort Macdonald and Badulla. I noticed it everywhere in the Jaffna peninsula; and Mr. Holdsworth writes that it is equally common at Aripu and Colombo.

Jerdon writes of this Bulbul that it is plentiful in many parts of South India, that it is not found in the forests of Malabar, but is common in low jungle and on the skirts of the forests occasionally. In the Carnatic it is tolerably common in bushy jungle, and even in gardens in wooded districts, also throughout the Northern Circars to Goomsoor; and in Central India it was found by Tickell. It is not, however, remarks Jerdon, known at Jubbulpore, Saugor, Nagpore, nor Mhow, nor on the bare tableland of the Deccan. Referring to 'Stray Feathers,' we find Dr. Fairbank testifies to its local distribution in his remarks on the Khandala district, and says that it is found in thickets by the Gatprabha river, but not on the Goa frontier; further north it inhabits portions of the country near Bombay. Mr. Ball writes that it is very abundant in Orissa, throughout a broad zone in which the vegetation is characterized by certain species of plants which are not met with further to the west, and which district, he says, extends "westwards as far as Ungul," beyond which it is not found. Colonel Tickell procured it at Midnapur, which, I imagine, is its most northern limit. In the Palani-hill list it is included as common at the east base of the hills.

Habits.—This Bulbul has been named the "Cinnamon-Thrush," on account of its abundance in the plantations of that tree in the Western Province. It is fond of frequenting open bushy land, scrub, woods in cultivated country, thickets at the edge of jungle, and underwood in dry forests; in heavily-timbered country it is not nearly so frequent, although it is more so than the Common Madras Bulbul. Except when feeding on some favourite fruit, it does not usually affect tall trees, but prefers to live in the thick cover afforded by brambles and other dense undergrowth, to none of which is it more partial than to the *Lantana*-scrub so abundant in the Western Province and in Dumbara. It associates usually in pairs, and, concealing itself from view, frequently utters its loud, jerky warble while threading its way through the thickets, or darting actively in and out with a quick irregular flight, and thus gives one the impression of being a most busy bird! In the evening it is particularly restless and noisy, and before going to roost flies to and fro among the bushes, darting into the thickest cover at hand, where it gives out its voluble notes, and then starts out again with a rustle loud enough to be caused by a much larger bird. It is both insectivorous and frugivorous in its diet, but chiefly the latter; and there is nothing to which it is more partial than the seeds or berries of the *Lantana*-plant.

Nidification.—The breeding-season of this bird in the west and south-west of the island lasts from December until June, the months of April and May appearing to be the favourite time. On the eastern side it breeds during the north-east rains. It builds in a low bush, placing the nest in the fork of an upright branch, sometimes 3 or 4 feet from, and at others close to, the ground. It is a rather loosely made cup-shaped structure, built of small twigs, grass-stalks, and fine roots, with occasionally a few dead leaves at the bottom to act as a foundation; the lining is scanty and is of fine grass. The eggs are from two to four in number, ovate in form, but sometimes stumpy at the large end; the ground-colour is reddish white or pale reddish, covered openly throughout with brownish or claret-red over a few markings of lilac-grey; in many specimens the spots are confluent round the obtuse end. They measure from 0·9 to 0·95 inch in length by 0·63 to 0·65 inch in breadth.

At Bombay it is recorded as laying in June and September, building a loose straggling nest in a bush a few feet from the ground; it is there made of fine twigs, lined with grass-stems, and portions of the exterior tied with wool and cobwebs to the surrounding twigs. A correspondent of Mr. Hume's draws attention to a nest which was tied at one place to a twig to prevent its being blown off its insecure site.

Genus RUBIGULA.

Bill short, stout, rather straight; rictal bristles moderate. Wings short and rounded; the 4th and 5th quills equal and longest. Tail nearly even at the tip. Legs and feet small. Tarsus feathered just below the knee, as in the preceding genus; toes short; claws long and acute.

A portion of the back of the neck bare, but overlaid by the occipital feathers. Nuchal hairs short.

RUBIGULA MELANICTERA.

(THE BLACK-HEADED BULBUL.)

(Peculiar to Ceylon.)

Muscicapa melanictera, Gmelin, Syst. Nat. i. p. 941 (1788).

Ægithina atricapilla, Vieill. N. Dict. i. p. 176 (1816).

Iora nigricapilla, Drapiez, Dict. Class. vi. p. 170 (1840).

Rubigula aberrans, Blyth, J. A. S. B. 1846, xv. p. 287.

Pycnonotus atricapillus, Blyth, Cat. B. Mus. A. S. B. p. 211 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 125.

Pycnonotus nigricapillus, Kelaart, Prodromus, Cat. p. 123 (1852).

Rubigula gularis, Kelaart, *l. c.*

Rubigula melanictera, Walden, Ibis, 1866, p. 316; Blyth, ibid. 1867, p. 304; Legge, J. A. S. (Ceylon Br.) 1870–71, p. 44; Holdsworth, P. Z. S. 1872, p. 452; Legge, Ibis, 1874, p. 20; id. Str. Feath. 1875, p. 368; id. Ibis, 1875, p. 396.

Yellow-breasted Flycatcher, Brown, Ill. pl. 32; *Le Cap nègre*, Le Vaill. pl. 140; *Le Gobe-mouche noir et jaune de Ceilan*, St. Croix; *Black-capped Tanager*, Latham.

Ka-kurulla, Sinhalese in Western Province.

♂ *ad.* suprà saturatè flavicanti-viridis, uropygio et supracaudalibus latiùs flavis: tectricibus alarum dorso concoloribus, majoribus et primariis brunneis lætiore flavo limbatis, secundariis dorsi colore lavatis: rectricibus nigricanti-brunneis, versùs basin olivascentibus et olivaceo lavatis, omnibus (duabus mediis exceptis) albo terminatis, exterioribus latiùs apicatis: pileo haud cristato nuchâque nitide nigris: loris, facie laterali, genis et regione paroticâ nigris: corpore subtùs toto lætè flavo, lateribus vix olivascenti lavatis: subalaribus et axillaribus flavis, majoribus basaliter albis: remigibus infrà brunneis, intùs versus basin albicanti marginatis: rostro nigro: pedibus nigricanti-olivaceis: iride sordidè rubrâ.

Adult male and female. Length from 6·3 to 6·5 inches; wing 2·7 to 2·9; tail 2·5 to 2·6; tarsus 0·6; mid toe and claw 0·58; hind toe and claw 0·48; bill to gape 0·75 to 0·8. Females are the smaller of the sexes.

Male. Iris dull red; bill black; legs and feet blackish.

Female. Iris *dark brown*; legs and feet deep plumbeous or blackish blue.

Head and face, down to the level of the lower mandible, glossy black; lower part of hind neck, back, scapulars, upper tail-coverts, upper surface of tertials, and edges of quills dusky olivaceous green, palest on the rump, and with a brighter or yellowish hue on the outer webs of the primaries; the first primary and the tips and inner webs of all the other quills brown; tail blackish brown, edged, principally near the base, with the hue of the back, and with a terminal white spot to all the feathers but the central pair, which are simply tipped with it; chin, throat, lower part of breast, abdomen, and under tail-coverts saffron-yellow; the chest and flanks washed with olivaceous green; under wing-coverts and flexure of the wing yellow.

Obs. The history of this species has been fully worked out by the late Lord Tweeddale in an article published in the 'Ibis' for 1866, in which is given a comprehensive review of the different names applied to it by various authors, and a satisfactory conclusion arrived at as to which should have the priority. Vieillot's name of *atricapillus*, founded on Le Vaillant's "*Cap nègre*" (a title bestowed by the latter in 1802 upon a bird six specimens of which he received from Ceylon), was thought to be the oldest, and is the one used by Layard in his notes on the ornithology of Ceylon. It is, however, plainly demonstrated, in the article referred to, that the bird was sent from Ceylon many years previous by Governor Loten and figured by Brown in 1776, in his 'Illustrations,' as the Yellow-breasted Flycatcher, upon which plate Gmelin founded, in 1788, his *Muscicapa melanictera*, thus establishing, by fourteen years, the priority of this last-named specific title. Some doubt is maintained as to whether the *Cap nègre* is really a peculiar Ceylonese form after all; for Gould described a species, *said to be* from Travancore, under the name of *Brachypus gularis*, and which the Marquis of Tweeddale (*loc. cit.*) contends, from the description of the skin, was identical with the Ceylon bird. Some years later Jerdon figured another species with a red throat from Malabar, which he considered might be the same as Gould's bird, in the description of which no mention was made of the red throat. He styled it *Brachypus rubineus*, which title, however, he afterwards placed as a synonym of *Brachypus gularis*, in the 'Birds of India;' and the latter name, I observe, is still in vogue with Indian naturalists when writing of the Ruby-throated Bulbul. Now either Gould's bird was from Ceylon and not from Travancore, or else it was from the latter place and he omitted to notice the red throat* in his description; or, failing this, perhaps he had to do with a young bird which had not acquired this distinguishing character. If neither hypothesis holds good, then Gould's bird was actually the same as ours, which, therefore, inhabits the South of India as well as Ceylon, and his name does not apply to Jerdon's Ruby-throated Bulbul. I cannot bring myself to accept this latter theory, as the present species has never since been detected in South India, and I am loath to reduce it from its rank in this work as a *Ceylonese* bird.

It is remarkable that the eye of the male should differ from that of the female. We find the same singular character in the case of two other Ceylon birds, viz. the Red-faced Malkoha and Palliser's Ant-Thrush.

Distribution.—The Black-headed Bulbul occurs throughout all the forest-tracts of the low country, ascending the mountains of the Kandyan and Southern Provinces to an altitude of about 5000 feet in the former, and to the limits of the jungle in the latter. It is plentiful in suitable localities in the Western Province, being found within 4 or 5 miles of Colombo; it is also abundant in all the south-western hill-regions, although almost absent from the arid maritime district between Hambantota and the Park country. It is a common bird in all the forests of the northern half of the island, being numerous round Trincomalie and along the coast to the north of that place. In Uva, Haputale, and the eastern coffee-districts it is found up to the afore-mentioned altitude; but I have not observed it so high on the western side. About Kandy and the circumjacent districts it is very common, preferring to the forests the deep valleys of the Mahawelliganga and its affluents the Maha oya and Bilhul oya, as well as other similarly openly-wooded localities. Mr. Holdsworth does not record it from Aripu, the country in that immediate district being too open for it; but I have no doubt but that it is found in the adjacent forests of the interior.

Habits.—The "Cap nègre" frequents shady luxuriant forest, low jungle, cheena-woods, deserted grounds, the wooded borders of tanks, and so forth. It is very partial to forest, and is one of the commonest denizens of such locality in Ceylon. It is met with either in pairs or three or four together, and at times is socially inclined towards its neighbours of the forest, consorting with the Forest-Bulbul, *Criniger ictericus*; and in less heavily timbered spots may be found in company with the common White-eyebrowed Bulbul, *Ixos luteolus*. It delights in the well-wooded shady ravines, watered by rocky streams, which intersect the patnas throughout the Central Province; and while halting for an instant by these delightful brooks on my journeys from one estate to another, I have generally heard its unpretending little warble, which is much like the syllables *whēe-whee, whēe-whēe*, frequently repeated. It generally affects the lateral branches of large trees, and searches about among the outspreading boughs for its food, which is chiefly insectivorous; small seeds are sometimes devoured by it, and I have found snails of some little size and also minute ammonites in its stomach. I have occasionally seen small parties in the topmost boughs of large trees; but to ascend thither is not its usual habit, and in such cases it is probably enticed from the foliage beneath by the presence of other birds.

* Lord Tweeddale latterly held this idea, which he expressed to me, *in epist.*, shortly before his death.

Towards its own kin it is extremely sociable, generally living in close fellowship, particularly in the nesting-time. It is rarely disturbed without the little call-note *whēē-whēē* being speedily heard, and its companion is seen flying across the jungle-path or other spot in search of it.

Nidification.—This Bulbul breeds in the southern and central portions of the island from April to September, probably rearing two broods. In the Kandyan Province Mr. Bligh has found its eggs in the former and I myself in the latter month. It usually builds in the fork of a low tree or bush near the ground, and sometimes even on a dead stump. I have taken the nest fixed in a horizontal bifurcation of a small branch which overhung a mountain-stream. It was a loosely-constructed fabric, but tolerably substantial notwithstanding, made in a cup-shape of fine roots, grass, bents, and very small twigs, among which were fixed some dead leaves, the interior being lined with fine grasses. The eggs were two in number, and the diameter of the nest inside was $1\frac{3}{4}$ in. by $1\frac{1}{4}$ in. in depth. In other nests brought to my notice there were three eggs; one of these was constructed of grass and creeper-tendrils and placed on a low stump amidst some bushes. In the southern province I have received its eggs in the beginning of April. Mr. Bligh describes to me a nest which he found in Haputale on the top of an isolated bush about 6 feet from the ground. "It was," he writes, "barely daylight when it was discovered, and the old bird was on the nest; this I took; and about half an hour afterwards, on returning to the spot, found the bereaved pair sitting by each other, their sides touching, close to the former position of the nest; and though I approached within two yards of them, they sat still, wearing the most dejected aspect—as well they might!—causing me much to regret having removed it, although I *was* under the impression that it was the first nest of this species ever discovered." It was, he remarks, a simple but very strong little structure for the materials used; the outside was principally composed of small dead leaves with rough surfaces, next to which was a thin weaving of a kind of flower-stalk which partly entwined the leaves; these stalks were a few inches in length, with a rough exterior, and of the thickness of very thin twine: to the minute barbs on the snrface of these stalks was fixed here and there some spiders' webs, which, combined with the peculiar nature of the stalks, which readily adhered to one another, formed a compact and strong material. The interior measured 2 inches in breadth by $1\frac{1}{2}$ inch in depth, and was lined with fine grass and fibres.

The eggs vary but little in character: the ground-colour is reddish white, thickly covered with moderately-sized spots of reddish brown, dusky red, and red, under which lie a few specks of bluish grey; in some specimens the markings are confluent at the large end: in shape they are rather broad ovals, slightly pointed at one end, and average 0·78 to 0·8 inch in length by 0·57 to 0·59 inch in breadth.

In the Plate accompanying my article on *Myiophonus blighi* is to be found a figure of a male of this species shot near Kanthelai Tank.

Genus KELAARTIA.

Bill with the upper mandible more curved than in *Rubigula*; rictal bristles well developed. Wings rounded, with the 3rd and 4th quills shorter than in the last; the 5th and 6th the longest. Tail nearly as long as the wings. Legs and feet robust. Tarsus scutellated.

Feathers of the crown scale-like; nuchal hairs long.

KELAARTIA PENICILLATA.

(THE YELLOW-EARED BULBUL.)

(Peculiar to Ceylon.)

Pycnonotus penicillatus, Blyth, J. A. S. B. 1851, xx. p. 178; Kelaart, Prodromus, Cat. p. 123 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 125.

Kelaartia penicillata, Jerdon, Cat. B. S. India, Suppl. Madr. Journ. 1845, xiii. no. 70; id. B. of Ind. ii. p. 86 (1863); Holdsworth, P. Z. S. 1872, p. 450; Legge, Ibis, 1874, p. 20; id. Str. Feath. 1876, p. 245.

♂ *ad.* suprà flavicanti-viridis, tectricibus alarum dorso concoloribus: remigibus saturatè brunneis, extùs flavicanti-viridi marginatis, secundariis intimis ferè omninò flavicanti-viridibus: rectricibus olivascenti-brunneis, extùs flavicanti-viridi lavatis et angustè flavo terminatis: pileo summo nigricante, postice flavicanti-viridi lavato: fasciâ lorali albâ: palpebrâ summâ albâ: loris posticis et facie laterali nigricanti-brunneis, fasciâ per regionem paroticam superiorem ductâ lætè flavâ: supercilio lato, lætè flavo, supra regionem paroticam ducto, fasciam penicillatam formante: genis anticis gulâque albis: colli lateribus cinereis; gulâ imâ et corpore reliquo subtùs flavis, lateribus olivascenti-viridibus: subalaribus et margine alari flavis: remigibus infrà cinerascenti-brunneis, intùs albo marginatis: rostro nigro: pedibus nigricantibus: iride rufescenti-brunneâ.

Male. Length 7·5 to 8·0 inches; wing 3·2 to 3·4; tail 3·1 to 3·2; tarsus 0·75 to 0·8; mid toe and claw 0·8; hind toe and claw beneath 0·6; bill to gape 0·85.

Iris red mingled with brown, or red deepening to brown next the pupil; tarsi and feet dark leaden blue: bill black.

Lores, cheeks, forehead, and crown dull black, paling on the occiput into the olive-green of the hind neck, back, rump, wings, and tail, and changing into a grey patch below the ears; a stripe from the nostril up the side of the forehead, a spot at the upper eyelid, the chin and gorge white; a bright yellow tuft of lanceolate feathers passing back to the neck springs from above the eye, and an impure yellow spot lies on the ear-coverts; inner webs of quills and rectrices blackish brown, the latter washed with the olive-green of the outer webs; tips of tail-feathers beneath yellowish; throat yellow, changing into olivaceous or greenish yellow on the under surface; the abdomen and centre of lower breast nearly as yellow as the throat; flanks dusky, under tail-coverts like the breast. Variations exist in the depth of the green of the upper surface and in the yellow of the under surface.

Female (somewhat smaller). Length 7·1 inches; wing 3·1. Bill, legs, and feet as in the male. The tail-feathers are more broadly tipped with yellowish beneath as a rule.

Young birds of the year have the feathers of the head edged whitish, and the yellow of the throat less in extent and more clearly defined from the hue of the chest.

Obs. Until the publication of Dr. Jerdon's great work on Indian birds this species held rank as a *peculiar* Ceylonese form. It was discovered by Kelaart, and forwarded by him to Blyth, with, it appears, the suggested name of *penicillata*. It was described by Blyth, *loc. cit.*, and placed among the Ceylonese local forms. Jerdon, however, included the species in his 'Birds of India' on the evidence of a specimen from the south of the peninsula, of which he writes as follows:—"I believe that this Ceylon bird is identical with one procured by me from the Mysore country, below the Nilghiris, which was accidentally destroyed before I had taken a description; but I had a coloured sketch drawn, from which I briefly described it in my 'Supplement Cat. Birds of South India.'" From that time until the present no second example has, to my knowledge, ever been procured; and Mr. Hume, even, has no record of its occurrence in South India. I therefore include it in this work among the birds "peculiar to Ceylon." Its slight differences from *Ixos* entitle it to generic rank; and it forms the second genus only peculiar to the island, *Phænicophaës* being the first.

Distribution.—This handsome Bulbul is a hill species, and more exclusively confined to the upper regions than any of our "peculiar" birds, with the exception of *Stoparola sordida*. It is abundant in all the higher parts of the Central Province, from the altitude of Horton Plains and the Nuwara-Elliya plateau to about 3500 feet, at which elevation it is common in the Kandyan and other western districts. In Uva, however,

it is not so numerous at that height, but is found more in the forests above 4000 feet. In the Knuckles it is plentiful in the upper forests, as well as in the wooded patnas. In the southern ranges it is found in the higher parts of the Morowak and Kolonna Korales.

Habits.—This showy Bulbul affects forest by choice, frequenting likewise the outskirts of jungle surrounding coffee-estates and patna-woods which line mountain-streams in the Central Province. It lives in low jungle and about underwood more than in the upper branches of lofty trees, except when the latter are in fruit, and it then congregates in flocks, sometimes in company with the Blackbird. A tree thus besieged with the feathered inhabitants of the Ceylon forests presents a lively scene. The sprightly Yellow-eared Bulbuls dart in and out, chasing one another among the boughs and greedily feeding on the fruit, which drops with a constant patter on the leaves beneath, while the more conspicuous Blackbirds, equally active in their movements, fly hither and thither and endeavour to drive away their smaller companions from the feast. It is shy in its disposition, and has a quick darting flight, during which it often utters its not unpleasing whistle, which resembles the syllables *whee, whee, whee,* quickly repeated. Notwithstanding its timid nature it is very inquisitive, and will often fly into a bush, close to a bystander, peer at him, and then disappear as suddenly as it came. The resemblance in the style of head-plumage in this bird to that of some of the Meliphagidæ from Australia is singular; the tufts or gay-coloured stripes about its face call to mind the markings of *Meliphaga novæ-hollandiæ.*

In the Plate accompanying my article on *Malacocercus rufescens* will be found a figure of the present species.

Genus PYCNONOTUS.

Bill stout, slightly curved. Nostrils somewhat advanced; rictal bristles stout. Wings with the 1st quill half the length of the 4th, which is the longest. Tail moderately long, square at the tip. Tarsus somewhat lengthened, shielded with smooth scutæ. Head crested; nuchal hairs well developed.

PYCNONOTUS HÆMORRHOUS.

(THE MADRAS BULBUL.)

Muscicapa hæmorrhousa, Gm. Syst. Nat. i. p. 941 (1788).

Hæmatornis pusillus, Blyth, J. A. S. B. 1841, x. p. 841.

Pycnonotus hæmorrhous, Blyth, J. A. S. B. 1845, xiv. p. 506; id. Cat. B. Mus. A. S. B. p. 209 (1849); Kelaart, Prodromus, Cat. p. 123 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 125; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 240 (1854); Jerdon, B. of Ind. ii. p. 94 (1863); id. Ibis, 1867, p. 8; Holdsworth, P. Z. S. 1872, p. 451; Ball, Str. Feath. 1874, p. 292; Butler & Hume, ibid. 1875, p. 473.

Ixos cafer, Sykes, P. Z. S. 1832, p. 88.

Molpastes chrysorrhoides, Adam & Hume, Str. Feath. 1873, p. 378.

Molpastes pusillus, Hume, Nests and Eggs, ii. p. 291 (1874).

Molpastes hæmorrhous, Fairbank, Str. Feath. 1877, p. 405.

Red-vented Flycatcher, Brown, Ill. Zool. pl. 31. fig. 1 (1776). *Bulbul*, Hind.; *Tonki bulbul*, Bengal.; *Pigli pitta*, Telugu; *Konda lati*, Tam. in India (Jerdon). *The Ceylon Nightingale* of some in Ceylon.

Kondé-kurulla, Sinhalese; *Kondaela*, Tamil, lit. "Topknot bird," from the crest; *The Condatchee Bulbul* (Kelaart); *Pastro kondache*, Portuguese in Ceylon.

Male. Length 7·6 to 8·0 inches; wing 3·75; tail 3·2; tarsus 0·85; mid toe and claw 0·85; hind toe and claw 0·6; bill to gape 0·78.

Iris deep brown; bill black; legs and feet dark or sepia-brown.

Entire head, chin, and throat black, not so intense on the throat, and with the ear-coverts inclining to brown; the feathers of the back of head elongated and capable of being erected at will: hind neck, back, wings, chest, upper part of breast, and thigh-coverts sepia-brown of various shades, deepest adjoining the black of the head and throat, palest on the breast, and edged with greyish white everywhere but on the lower flanks; the edgings are whitest on the sides of the neck, where they coalesce to form a white streak next the black of the throat; quills pale-edged exteriorly: tail blackish brown, broadly tipped with white; under tail-coverts shining crimson.

Birds from high altitudes, such as the upper parts of Uva and about Hakgala have the edgings of the feathers more albescent than low-country specimens, and the whole plumage has a paler appearance.

Young. The black of the head and throat not so intense; and the upper surface with less plainly defined edgings of fulvous grey; quills margined externally with rusty brownish; tail with an obsolete black terminal band, a dusky whitish tip, and the base paler than in the adult: vent and under tail-coverts reddish.

Obs. Some doubt exists as to the true specific name for this species. It has been of late referred to under Blyth's title *Pycnonotus pusillus*, which was held by this naturalist, in his commentary on Jerdon's 'Birds of India' (Ibis, 1867, p. 8), to be alone applicable to the Madras Bulbul, on the ground that the *Muscicapa hæmorrhousa* of Gmelin referred to a Chinese species (*Ixos chrysorrhoides*). It does not, however, appear to me that this is a matter beyond dispute, particularly as one of the localities given by Gmelin for his species was *Ceylon* (Syst. Nat. i. p. 941). I prefer, therefore, not to depart from the nomenclature adopted by Jerdon and others: and I observe that Mr. Hume, in his later notices of this bird, applies Gmelin's title to it. This peculiarly Indian genus of Bulbuls runs through a series of closely-allied species from *P. pygæus*, the large northern representative of the present, to *P. atricapillus*, which is common in the north of Tenasserim. The first-named bird differs from ours in its plumage by having the ear-coverts glossy chestnut-brown, and the black of the head descending upon the hind neck, where it pales into the blackish brown of the back—thus being a much darker bird above, while in the lower parts it is paler. The wings of Nepal, Himalayan, and Assam specimens which I have examined vary from 4·1 to 4·2 inches. *P. nigropileus*, a more eastern race than the last, found in Tenasserim, differs, says Blyth, from *P. hæmorrhous* "in having no black on the throat and breast, which are brown, with greyish margins to the

feathers, like the back; and the whole nape and back are much paler than *P. hæmorrhous*, the cap alone being black;" wing 3·6 to 3·7 (*Hume*). *P. atricapillus* may be said, writes Mr. Hume, to be like *P. nigropileus*, but with the throat, ear-coverts, breast, and abdomen uniform very pale greyish whity brown.

Distribution.—This very common bird is found abundantly throughout the whole of the island to a general altitude of about 3500 feet, and in Uva ranges to about 5900 feet, its highest point being the neighbourhood of Hakgala, to which it extends from the Fort-MacDonald patnas, a portion of the Kandyan Province where many low-country birds are located. It is most numerous in open and cultivated districts, particularly in the west and south of the island and in the maritime portions of the eastern and northern divisions. In the extensive forests of the east and north-central portions it inhabits chiefly those localities which have been cleared and are now open or covered with low jungle; but in the depths of the woods it is less frequent than the White-eyebrowed Bulbul. In Dumbara and other wide valleys of the Central Province it is almost as common as in the low country, but it does not range so high on the Rambodde side as in Uva. Neither Kelaart nor Mr. Holdsworth record it from Nuwara Elliya, nor have I myself observed it there: that it should not occur even as a straggler or occasional visitant in the gardens of the residents, while it is not unfrequent just lower down the valley at Hakgala, is perhaps a proof that it is not able to withstand the frost and cold at nights on the plain.

Of this Bulbul Jerdon says that it is one of the most common and generally-spread birds in the south of India, extending throughout the southern part of the peninsula to the Nerbudda river, and beyond it apparently to the north-west. It ascends the Nilghiris to about 6000 feet, and it is, says Dr. Fairbank, found at the top of the Palanis, though it is more abundant at the bottom and on the adjacent plains; in the Khandala district it is an inhabitant of the slopes of the hills, as well as the neighbouring portion of the Deccan. To the north-west it extends as far as Sindh, to the avifauna of which province Mr. Blanford has recently added it, stating that it is found in the deserts of Umarkot. Captain Butler remarks that it is found all over the hills and plains of Northern Guzerat, to which Mr. Hume adds, "Common at Sambhur and in the eastern portions of Jodhpoor, also in Cutch and Kattiawar. In Western Jodhpoor it occurs for the most part only in the rains." In Bengal it is replaced by the large and allied species *P. pygæus*, which extends eastwards into Burmah.

Habits.—The Madras Bulbul affects gardens, compounds, cinnamon-plantations, the vicinity of roads, low jungle, open scrubby land, and the edges of forest. It is a fearless and very sprightly bird, most active and animated in its manners, erecting its conspicuous crest to full height as it sits on the top of a bush chirping to its companions. It locates itself in close proximity to houses, and not unfrequently builds its nest in verandahs, and is consequently a universal favourite with Europeans, who rate its attempts at singing so highly that it is styled by many the "Ceylon Nightingale"! As a matter of fact, however, its notes have but little music in them; but it is constantly uttering its quick chirruping warble, which, in the breeding-season, is to a certain extent more melodious than at other times. Its food consists of insects, as well as fruit and seeds of all kinds, the berry of the *Lantana*-plant being a favourite diet, a fact which conduces to the propagation and spreading of this horticultural pest. In the evening little parties of this Bulbul assemble, and after a great deal of excitement and chattering they choose a roosting-place in some thick bush or umbrageous shrub.

Jerdon remarks, in his 'Birds of India,' that in the Carnatic it is kept for fighting, and that it seizes its antagonist by the red feathers, attempting to pull them out. It is said to imitate the notes of other birds when caged. I am not aware that this habit has been much noticed in Ceylon; but it is a great favourite as a caged bird with the natives, becoming excessively tame, and allowing itself to be carried about by hand.

It is, according to the author of the 'Birds of India,' found in that country usually in pairs or in small families, flying briskly about, restless and inquisitive, feeding chiefly on fruits, but occasionally descending to the ground, and even hopping a step or two and picking up insects; "it destroys various buds and blossoms, and is very destructive to peas, strawberries, brazil-cherries (*Physalis peruviana*), and other soft fruit."

Nidification.—In the western and southern portions of the island this bird breeds, as a rule, between January and May, and on the eastern side during the north-east rains at the end of the year. It appears,

however, to have more than one brood in the year, the second being reared as late as August or September. Its nest is a loosely-made cup-shaped structure of fine twigs, grass, and bents, with a scanty lining of grass or vegetable fibre, fixed in the fork of a branch in low bushes a few feet from the ground. It frequently chooses a small lime-tree close to a dwelling, and will sometimes, as above-mentioned, build in the verandahs of houses. In a rest-house on the Trincomalie and Batticaloa road, I once found a nest placed between the tiles and a rafter over the entrance to the apartment, the pretty little owner taking no notice whatever of the passers-by, and, as we stood admiring her, scanned us from her little habitation with an amount of fearless curiosity that was charming to behold. The eggs are three or four in number, and vary somewhat in shape, the usual form being a pointed oval. The ground is reddish white, blotched and speckled all over, but most thickly at the large end, where there is often a cap or zone of colour, with reddish brown of two shades over a few bluish-grey spots, some eggs having much more of the latter tint than others. They measure from 0·84 to 0·87 inch in length by 0·64 to 0·66 in breadth.

In India the breeding-season lasts in the plains from April until August, but in the Nilghiris it breeds as early as April. Its nest is much the same as in Ceylon; but the late Mr. A. Anderson speaks of one which was "entirely composed of green twigs of the Neem-tree on which it was built, and the under surface was felted with fresh blossoms belonging to the same tree." Mr. Hume gives the average of sixty eggs as 0·89 inch in length by 0·65 inch in breadth.

PASSERES.

BRACHYPODIDÆ.

Subfam. PHYLLORNITHINÆ.

Bill longer than in the last subfamily, curved in some genera throughout; rictal bristles minute. Tail rather short. Legs and feet robust.

Body-plumage lengthened and fluffy. Nuchal hairs absent. Tongue in some bifid.

Genus PHYLLORNIS.

Bill long, gently curved, wide at the base, much compressed towards the tip; gonys-angle imperceptible; rictal bristles minute. Wings moderately long and pointed; the 4th quill the longest; the 1st about half the length of the 4th. Tail moderate, even at the tip. Legs and feet stout. Tarsus short, covered in front with a single scale. Toes short.

PHYLLORNIS JERDONI.

(THE GREEN BULBUL.)

Phyllornis jerdoni, Blyth, J. A. S. B. 1843, xii. p. 392; id. Cat. B. Mus. A. S. B. p. 212 (1849); Kelaart & Layard, Cat. Ceylon B. Prodromus, App. p. 57 (1853); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 176; Jerdon, B. of Ind. ii. p. 97 (1863); Holdsw. P. Z. S. 1872, p. 451; Hume, Nests and Eggs, ii. p. 294 (1874); Ball, Str. Feath. 1874, p. 410.

Chloropsis jerdoni, Jerd. Ill. Ind. Orn. pl. 43 (1847).

Chloropsis cochinsinensis, Jerd. Cat. B. S. India, Madr. Journ. 1839, x. p. 247.

Blue-chinned Thrush, Lath. Hist. v. p. 93; *Leaf-bird* of some; *Common Green Bulbul*, Jerdon. *Harrewa*, Hind.; *Wanna bojanum*, lit. "Ornament of the forest," Telugu (Jerdon); *Hurrooa* in Manbhoom.

Giraw-kurulla, Sinhalese.

Adult male and female. Length 7·3 to 7·5 inches; wing 3·3 to 3·5; tail 2·8; tarsus 0·75; mid toe and claw 0·7; hind toe, from sole, ·35; bill to gape 0·95. The 3rd quill is shorter in proportion to the 4th than in the next species.

Iris brown or pale brown; bill, upper and lower mandibles blackish; legs and feet pale bluish, milky blue, or pale lavender.

Above and beneath, including the wings and tail, grass-green; lores, cheeks, chin, and throat glossy black, enclosing a shining hyacinth-blue cheek-stripe; the forehead, above the eye, and all round the black gorget washed with yellowish, showing plainest in well-plumaged birds; a brilliant turquoise-blue patch on the ulna, and a trace of the same at the metacarpal joint (in some specimens the median wing-coverts are edged with blue); inner webs of quills brown, those of the secondaries washed with green near the tip; under surface of tail greenish grey.

Female. Has a small throat-patch and the lores bluish green instead of black, and the cheek-stripe greenish blue: the wing-patch is less in extent, and the yellowish border round the throat generally more pronounced than in the male.

Obs. A comparison of Ceylonese specimens with South-Indian and peninsular examples enables me to say that our birds do not differ from continental ones. The following are the data from several examined:—Madras—♂, wing 3·45; Travancore—♂, wing 3·5, bill to gape 0·85; Behar—♂, wing 3·6, bill to gape 0·95; Bengal—♀, wing 3·4, bill to gape 0·85. Mr. Ball gives the wing-dimensions of four examples from the Chota-Nagpur district as 3·4 to 3·5 inches; from which results it appears that the example from Behar is longer in the wing and bill than those from other localities. The head and throat are similar in coloration; but a specimen from Madras exhibits an abnormal feature in having the black throat mingled with greenish-blue feathers; and the moustachial stripe is paler than in ordinary birds.

There are several other species of *Phyllornis* inhabiting the regions to the eastward of the Bay of Bengal; among these *P. cyanopogon* of Malacca is not very distantly related to the present. It is larger (wing 4·0), has more black on the throat and face, wants the yellowish bordering, and has a very narrow cheek-stripe.

Distribution.—The Green Bulbul is a very common bird in Ceylon, and diffused throughout all the low country, except those parts which are covered with scrubby vegetation, such as the oft-mentioned jungle-plains on the south-east coast, and similar localities on both sides of the north of the island. It is particularly numerous in the cultivated portions of the western and southern provinces, and ascends the hills of the latter region, as well as those of the Kandyan district, to a considerable altitude. I have met with it in the Morowak-Korale coffee-estates and in the central ranges up to 3500 feet, and in Uva it may possibly be found at a greater elevation. It occurs in open places, and especially on the borders of cultivation, throughout the northern half of the island, the edges of the luxuriant jungle surrounding the great tanks being a favourite locality. In the vicinity of Trincomalie I found it on the borders of paddy-fields and in isolated clumps of

trees on irrigated land near village tanks. It is common in the Jaffna peninsula, affecting the "Jack," tamarind, and other trees cultivated in native compounds.

In the 'Birds of India' we read that the Green Bulbul "is spread over a great part of the continent of India, not extending, however, to Lower Bengal or to the sub-Himalayan forests. It is extremely common in the Western Provinces and in the jungles of the Eastern Ghâts; but is more rare in the open country of the Carnatic, Mysore, and Hyderabad. It is found in Central India at Mhow, Saugor, &c., and through the vast jungles of Chota Nagpur up to Midnapore." Concerning the latter region, Mr. Ball writes that it occurs abundantly throughout the division, and remarks that it is found pretty generally in the region to the south of the Mahanadi river. Dr. Fairbank found it in the Palanis up to 4000 feet, and says that it frequents the hills from Khandala to Goa. It is not recorded by any observer in 'Stray Feathers' from the north of India, Assam, or Burmah, and does not, as far as is known at present, inhabit the eastern side of the Bay of Bengal. Col. Tickell figures it, in his MS. Illustrations of Indian ornithology, from Tenasserim; but Lord Tweeddale remarks that its occurrence there is extremely doubtful; in fact, though the plate represents the species, the description refers to another, *Ph. chlorocephalus*. Furthermore, Mr. Hume remarks, in his list of the birds of Tenasserim, that it certainly does *not* occur in that province.

Habits.—This "Leaf-bird" frequents compounds, gardens, openly-wooded country, the edges of roads leading through jungle, the borders of forests surrounding tanks, the outskirts of paddy-fields, banks of rivers, and such-like places. It chiefly affects the topmost branches of trees, and has a great partiality for the cocoanut-palm, about the heads of which it searches for insects, uttering its whistle, which can often be heard when the bird, hidden by the luxuriant fronds, is invisible from beneath; it often clings to the leaves like a Titmouse, and flits actively about among the sprigs of waving boughs in search of insects. The form of its bill is very much that of a Honey-eater; indeed, Bonaparte classed this genus among the Meliphagidæ, to which it has some affinity in the matter of habit, though its structure allies it to the short-footed Thrushes. There is, I think, no doubt that it sometimes sucks the honey from flowers: I endeavoured to detect it in this while in Ceylon, but was unsuccessful. Mr. Ball, however, writes (*loc. cit.*), "I have observed that it is especially fond of the flowers of the parasitic *Loranthus* which grows on many trees; so far as I could ascertain, it both sips the nectar from the flowers and catches the insects attracted by the same." I have more than once seen a little troop on the branches of a flowering tree, but was unable to ascertain if they were doing further than catch the insects, which, as Mr. Ball remarks, are attracted by such a condition. Seeds may often be found in its stomach, though they are not so generally partaken of as insects.

When not breeding, the females of this species collect in little flocks, and may be found in scattered company, searching for food and constantly uttering a sharp monosyllabic *chick* note. The ordinary voice of the males is comprised of a number of varied whistles; indeed the bird is capable of mocking almost any other species in the forest, and is a most clever imitator of the notes of Drongos, that of the white-bellied form inhabiting the northern forests being most cleverly mimicked by it. These powers of imitation are well known in India, and were first mentioned by Tickell, who remarks that it is a "most excellent mocker, and imitates the notes of almost every small bird in the country." Blyth likens its *call* to that of the Indian Black Drongo (*Dicrurus macrocercus*), though softened down and mellowed; this note, I imagine, is not natural to it, but is simply an attempt at mimicry, which can be so cleverly executed that it would vary in tone according to the particular King Crow that the bird was pleased to mock!

Nidification.—Common as this Bulbul is, I have never succeeded in finding or obtaining its nest. It breeds, I imagine, in April or May in the Western Province. Layard says that it makes an open cup-shaped nest; and he sent one to Sir William Jardine from Pt. Pedro, which the latter describes as having been placed upon a branch, and being flat in general form, and composed of soft materials, such as dry grass and silky vegetable fibres, rather compactly woven with some pieces of dead leaf and bark on the outside, over which a good deal of spider's web was worked.

Captain Beavan, who records it as breeding in April in Manbhoom, writes of a nest that was brought to him, "It is built at the fork of a bough and neatly suspended from it, like a hammock, by silky fibres, which are firmly fixed to the two sprigs of the fork, and also form part of the bottom and outside of the nest. The

outside is lined with dried bents and hairs. The eggs (creamy white, with a few light pinky-brown spots) are rather elongated, measuring 0·85 by 0·62 inch; interior diameter of nest 2·25 inches by 1·5."

Mr. Hume, generalizing, says, "The eggs are sparingly marked, usually chiefly at the larger end, with spots, specks, small blotches, hair-lines, or hieroglyphic-like figures, which are typically almost black, but which, on some eggs, are blackish (or even reddish) or purplish brown." The average size of a dozen is 0·86 inch by 0·6 inch.

PHYLLORNIS MALABARICUS.

(THE MALABAR GREEN BULBUL.)

Turdus malabaricus, Gm. Syst. Nat. i. p. 837 (1788).

Phyllornis malabaricus, Blyth, Cat. B. Mus. A. S. B. p. 212 (1849); Gould, B. of Asia, pt. xiii. (1861); Jerdon, B. of Ind. ii. p. 98 (1863); Holdsw. P. Z. S. 1872, p. 451; Legge, Ibis, 1874, p. 21; Fairbank, Str. Feath. 1876, p. 258.

Chloropsis malabaricus, Jerdon, Cat. B. S. India, 2nd Suppl. Madr. Journ. 1844–45, p. 124.

Phyllornis malabarica, Kelaart, Prodromus, Cat. p. 120 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 176; Bourdillon, Str. Feath. 1876, p. 400.

The Golden-fronted Green Bulbul; *The Malabar Honey-eater*, Kelaart.

Giraw-kurulla, Sinhalese (applied to both these species, probably on account of their being the colour of a Parrakeet).

Adult male. Length 7·5 inches; wing 3·5 to 3·6; tail 2·5 to 2·7; tarsus 0·7; mid toe and claw (straight) 0·75; bill to gape 0·85 to 1·0. The tail of this Bulbul is shorter and the under tail-coverts longer than in the preceding species, a distinguishing characteristic which is noticeable the moment the bird is handled.

Iris brown; bill blackish; legs and feet slaty bluish.

Above and beneath a darker green than in the foregoing; face, chin, and throat similarly enveloped in black, but the colour extends lower down on the neck and encircles the eye; maxillary stripe larger; forehead rich golden, shading gradually into the green of the head; the wing-patch deeper in hue, and along the carpal joint there is a streak of hyacinth-blue.

Young. The male of the year appears to have the forehead and throat green, as specimens are often procured with golden and black feathers mixed with the green respectively on these two parts; the maxillary stripe in these is small.

Female. Somewhat smaller than the male. Length 7·1 inches; wing 3·4; tail 2·3. Bill not so black as the male's. Forehead green; throat-patch and cheek-stripe smaller.

Obs. Not having had access to any South-Indian examples of this species I am unable to give data concerning them, but it is improbable that they differ in any way from insular specimens. The northern form of Golden-fronted Bulbul, *P. aurifrons*, erroneously included in the Ceylon list by Kelaart (Prodromus, p. 120), is allied to the present species. The male has the forehead more occupied by the golden hue, and the gorge, as well as the sides of the throat, are hyacinth-blue; the black of the fore neck is bordered beneath with golden yellow, and the wing-patch is larger than in *P. malabaricus*. The female, as in the present species, wants the golden forehead.

In my synonymy of this bird I have omitted Temminck's reference, Pl. Col. 512, as neither the drawing nor the description apply to the present species. The whole head, nape, sides of neck, and throat beneath the black gorget are yellow, and are described in the text as "une jaune jonquille," which "couvre la tête, la région des oreilles et s'étend en zone autour de la grande et large plaque noire qui couvre toute la gorge." He concludes his notice by saying that a couple of these birds were sent to him from Sumatra. The plate and description are *perhaps* those of *Ph. cochinchinensis*.

Distribution.—This handsome species has always been considered a rare bird in Ceylon: undoubtedly it is far less numerous than the last mentioned; but it is nevertheless widely distributed, both in the low country and in the mountain-regions of the island. Kelaart is said by Layard to have procured it at Nuwara Elliya; and though the latter speaks of it as confined to the upland districts, he only procured one example, which was brought to him by his collector "Muttoo," at Gillymally. There is an example in the British Museum collected at Nuwara Elliya by Mr. Boate. The first specimen which came under my notice was one which was obtained in Dumbara by Mr. Forbes Laurie, and afterwards noticed, in his catalogue, by Mr. Holdsworth.

In 1871 I met with it in the Kukkul Korale and afterwards obtained it in several parts of the island, and not unfrequently saw it in others. These localities were forests near Galle, coffee-estates in the Morowak Korale, the Kandyan district, Uva, the Trincomalie, Anaradjapura, and Kurunegala districts, and lastly in Saffragam and the Pasdun Korale. In the hills I have not seen it myself above 4000 feet. It will, I believe, be found throughout the northern half of the island wherever there are forests, and the same as regards the south-eastern jungle-clad plains. Mr. Parker writes me that he has found it at Uswewa. While at large this bird would, of course, be taken for the commoner species, as it is not distinguishable from it unless viewed close enough to see its yellow forehead.

On the mainland this bird's habitat is restricted to the southern and central portions of the Indian peninsula. I am not aware that it extends further north than Bombay; and being partial to the damp climate of the Malabar region, it does not appear to extend nearly so far north on the eastern coast; at any rate Mr. Ball, who procured *P. aurifrons,* the northern representative of this species, in the district between the Mahanadi and Godaveri rivers, did not meet with the present bird in that region. Dr. Fairbank writes that it is found along the hills from Khandala to Goa, and usually near their western base. In Travancore Mr. Bourdillon says that it is a common bird in open jungle with large trees. All that is mentioned of it by Jerdon is as follows:—"This species is found most abundantly in the forests of Malabar, in Wynaad, Coorg, and on the sides of the Nilghiris up to about 4000 feet of elevation. It is also found, though rarely, on the Eastern Ghâts and in some of the forests in Central India."

Habits.—In its economy this handsome Bulbul does not differ materially from the last species; but it does not appear to be so much given to the science of mimicry! I have found it frequenting the topmost branches and lateral boughs of moderately sized trees where the forest was not very dense, and also the outskirts of patna-woods and the borders of jungle surrounding tanks in the Northern Province. It is very active in its movements, and while hopping about and scrutinizing the leaves in search of food pipes out a shrill note, differing from the clear whistle of the last species. The male likewise gives vent to a series of chirps, which, combined, make up a short little warble. Of this performance Mr. Bourdillon remarks that the male makes an attempt to sing, uttering a few notes something like those of the Bronzed Drongo (*Chaptia ænea*). Jerdon observes that it is "seen in small parties, hopping and flying actively about the branches of trees, and lives both on fruits and insects, chiefly the latter."

Genus IORA.

Bill shorter and straighter than in *Phyllornis,* the tip slightly notched. Nostrils oval and exposed; rictal bristles very minute. Wings rounded; the 4th and 5th quills the longest, the 3rd considerably shorter, and the 2nd less than the secondaries. Legs and feet weak; the tarsus lengthened, equal to the middle toe and claw, and covered with wide smooth scales; toes short, the outer one considerably joined to the inner at the base.

Plumage of the lower back and flanks lengthened and fluffy.

IORA TIPHIA.

(THE COMMON BUSH-BULBUL*.)

Iora tiphia, Linn. Syst. Nat. i. p. 331 (1776); Blyth, Cat. B. Mus. A. S. B. p. 214 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 266 (1854); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 267; Jerdon, B. of Ind. ii. p. 103 (1863); Armstrong, Str. Feath. 1876, p. 326; Hume, ibid. 1877, p. 428.

Iora multicolor, Gmelin, Syst. Nat. Linn. i. p. 924 (1788).

Iora zeylonica, Gmelin, Syst. Nat. Linn. i. p. 964 (1788); Blyth, Cat. B. Mus. A. S. B. p. 213 (1849); Kelaart, Prodromus, Cat. p. 121 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 267; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 267 (1854); Jerdon, B. of Ind. ii. p. 101 (1863); Holdsw. P. Z. S. 1872, p. 452; Butler, Str. Feath. 1875, p. 473.

Iora scapularis, Horsf. Trans. Linn. Soc. iii. p. 152 (1821).

Ægithina zeylonica, Hume, Str. Feath. 1873, p. 438.

Ægithina typhia, Ball, Str. Feath. 1874, p. 411; Hume, Nests and Eggs, ii. p. 295 (1874); id. Str. Feath. 1875, p. 129.

The Green Indian Warbler, *The Ceylon Warbler*, and *The Green-rumped Finch* (Latham); *The Ceylon Blackcap*, Brown; *The Ceylon Bush-creeper*, Kelaart; *The Black-headed Green Bulbul* and *The White-winged Green Bulbul*, Jerdon. *Shoubiga*, Hind.; *Patsu jitta*, Telugu; *Pacha pora*, Tam. in India, lit. "Green Bird;" *Chak tuk*, Bengal. (Jerd.).

Kirikahaye and *Ka-kurulla*, lit. "Yellow Bird," Sinhalese (Layard); *Mam palla kuruvi*, Ceylonese Tamuls, lit. "Mango-fruit Bird."

Adult male and female. Length 5·2 to 5·6 inches; wing 2·4 to 2·6; tail 1·7 to 2·0; tarsus 0·8; mid toe and claw 0·6; bill to gape 0·72 to 0·75.

Male (black plumage). Iris grey, mottled with brown, occasionally hazel-brown; bill, upper mandible black, with a clearly defined blue edge; lower mandible dusky blue with a bluish margin; legs and feet slate-blue, claws black.

September (Colombo). Lores, top of the head, hind neck, wings, and tail deep black; the back and rump intermixed with dark olive-green, the centres of the feathers being of this colour; the terminal half of the median wing-coverts, the tips of the greater coverts, and the inner webs of the lower scapulars white (the latter forming a concealed tuft, except when the bird is in flight); middle primaries with a faint white edge; face, ear-coverts, throat, sides of neck, and under surface, with the under tail-coverts, rich yellow, most brilliant on the throat and chest; lower flank-feathers white and much elongated; under surface of quills at the base white.

This example, in which the breeding-plumage is as perfect as in any that I have seen from Ceylon, is in moult and *putting on* the dark upper surface; the greater wing-coverts are more tipped in one wing than in the other. The iris is *quite brown*. An individual shot in January (Colombo) is in the same plumage, but the greater wing-coverts are more tipped with white; the iris is hazel, mottled with grey. Another, shot in October (Colombo), is in the dark dress, but the back-feathers are merely smeared with black, imparting a sooty-green appearance, and the lower wing-bar is wider than in the two foregoing; the yellow of the under surface is not nearly so brilliant, which is invariably the case when the upper surface is not very black.

Green plumage: June (Galle). Iris grey; bill, legs, and feet as above; head, hind neck, back, and rump olive-green, slightly smeared with black on the tips of the nape-feathers; wings and tail black, the upper wing-band broad,

* This seems to me to be the most suitable name to apply to this species.

the lower, formed by the tips of the greater coverts, almost wanting, partly owing to abrasion; the secondaries and inner primaries very finely edged with yellowish; scapulars black, with the inner webs of those which are concealed white; lores yellowish, cheeks and an orbital fringe the same; throat, fore neck, and down the centre of the chest and breast pure saffron-yellow, but less bright than in the dark stage, and shading off into greenish on the sides of the chest and breast; lower flanks mostly white.

August (Pasdun Korale). In the green plumage; but the head and back more surrounded with black than in the last; both wing-bars conspicuous; commencing to moult to black plumage, new and imperfect dark feathers being perceptible among the old green ones of the back.

Obs. From the evidence adduced by these descriptions it may, I think, be concluded that the black plumage is put on in the autumn and the green in the spring. The former has been generally considered to be the breeding attire; but as the nesting-season in the south-west and west of Ceylon lies between February and June, it would appear that the black upper surface is not always a sign of breeding-plumage. I have seen black individuals, however, at all seasons of the year; and therefore the safest hypothesis is that some breed in the green and some in the black stage, as Mr. Hume and others have determined is the case in India; and it may be that the black plumage is, to some extent, a sign of age rather than a seasonal dress.

Female. Iris olive-grey; bill somewhat paler than in the male.

Head and upper surface dull grass-green; scapulars of a darker green, and the tail dusky green; wings *blackish*, the quills and the white-tipped coverts edged outwardly with yellowish green, and the former with white inner margins; tertials and a few of the inner greater coverts with broad yellowish-green outer and white inner edges; orbits, chin, throat, and centre of under surface yellow, shading on the sides into greenish.

Young. The immature males are very similar to females; but the wings are blacker, and the tail is blackish in some and mingled with green feathers in others. An example (November) in my collection has the longer tail-coverts and the central tail-feathers green, while the shorter coverts and the remaining rectrices are black.

Obs. The Ceylonese birds of this species belong to the southern or black-backed race, *I. zeylonica* of Gmelin. After a careful examination of Mr. Hume's masterly review of this perplexing form ('Stray Feathers,' 1877, pp. 428–41), I cannot but accept his decision that the *Iora zeylonica* of Gmelin, which is the "Ceylon Blackcap" of Brown and the "Green-rumped Finch" of Latham, is not separable from the *Iora tiphia* of Linnæus (the Green Warbler of Latham) inhabiting Bengal, and which was, in all probability, as Mr. Hume remarks, described from a female or young male. In the latter race, which is not found in the south of India and Ceylon, the males do not acquire the black back in the non-breeding-season, but frequently do while nesting, although, until the recently acquired large collection of Mr. Hume's demonstrated this to be the case, they were by many considered constantly to preserve the green back, as in the southern form. The yellow of the under surface is likewise not so brilliant. Mr. Hume has tabulated his enormous series from localities extending from Ceylon throughout all India, Burmah, Tenasserim, the Malay peninsula, and the larger islands of the archipelago, by which it appears that the females throughout all this range are inseparable, and that the black-backed males from Ceylon, South India, the Western Ghâts, and also Mount Aboo as an outlying station, are similar to those from the south of the Malay peninsula. Commencing in the central provinces and extending through Chota Nagpur, Lower Bengal, along the sub-Himalayan region to Assam, and thence through Burmah to Tenasserim, we find the *tiphia* type of males existing, with, however, as already mentioned, much individual variation in the character of their plumage out of the breeding-season.

We likewise have these individual irregularities in Gmelin's race, for it is evident that males breed in Ceylon sometimes with green backs; and they have been unquestionably proved to do so in the south of India. The female of the Javan bird, described by Horsfield as *I. scapularis*, was stated by Lord Tweeddale to be identical with the Indian *tiphia*, while the researches of Mr. Hume substantiate this opinion; and, as further evidence concerning the identity of the two species, I might mention that Horsfield's description of the note (which he compares to the word *cheetoo*), and the manner in which it is uttered, are in all respects applicable to that of the Indian *Iora*.

I. nigrolutea, Marshall, is an allied species, inhabiting the dry parts of western continental India, stretching across from the coast-region at Kutch to the north-west provinces. It is distinguished from the present bird by the white on the tail-feathers, of which Mr. Hume writes that the females always, and the males during the non-breeding-season, have the central pair almost wholly greyish white, with the tips generally purer white and the outer web often shaded with ashy; the rest of the tail-feathers are black, broadly tipped with pure white. In

the breeding-plumage the male has the white tippings to the lateral feathers more or less reduced, and the central tail-feathers, like the rest, jet-black and white-tipped. In other respects the plumage is not dissimilar to that of *I. tiphia.*

Distribution.—The Bush-Bulbul is a common bird in Ceylon and widely distributed, being scattered throughout all the low country and the hills up to about 2500 feet. It is of course numerous in the open cultivated lands of the south and west; but it is not less so in the scrubby low jungle-tracts round the north coasts, including the Jaffna peninsula. It inhabits also the east side of the island in the same abundance that it does the west. In the dry forests of the north-central part of the island it is not unfrequent, but it is not found in the damp timber-jungles of the south. In Dumbara and other similarly elevated valleys of the Kandyan Province it is not uncommon; but I am not aware that it ascends to the upper hills, except perhaps in Haputale and other districts in Uva bordering on the low country.

This Bulbul has a very wide distribution on the continent, and is, in many portions of the Indian peninsula and the regions beyond the Bay of Bengal, as common as it is in Ceylon. In Southern India it is an abundant inhabitant of the plains, and extends into the hills to the elevation of Ootacamund, whence Mr. Hume records it. It is not, however, noted either from the Travancore ranges by Mr. Bourdillon, nor from the Palanis by Dr. Fairbank, though the latter procured it at the base of the hills. It is found in the Deccan and in the northern parts of the Western Ghâts, whence it ranges to the north-west as far as Mount Aboo, where it occupies a somewhat isolated position, the circumjacent plains being inhabited by the recently discriminated and allied species, *I. nigrolutea.* Turning eastwards from the northern extremity of the Western Ghâts we find it inhabiting the central provinces, Chota Nagpur, and extending northwards to Oudh, Dehra Doon, Kumaon, Nepal, and along the Himalayas to Assam. In Lower Bengal it is common, and about Calcutta it is numerous. In Burmah it is also common, and inhabits therein the Irrawaddy Delta in tolerable abundance. It is plentiful throughout the province of Tenasserim, not, however, ascending the hills. Southward it extends through the Malay peninsula, specimens being recorded from Wellesley, Pinang, Malacca, and Singapore, and thence onward through the archipelago it is an inhabitant of Sumatra, Borneo, and Java.

Habits.—Owing to its partiality for large trees, which are usually found about the houses of Europeans in Ceylon, this little Bulbul is one of our most familiar birds. It delights in the luxurious shade of the suriah, the mango, the bread-fruit, and in the north the stately tamarind, which spreads out its welcome shelter in the midst of almost every sea-coast village. In one of these latter trees a pair (for they are generally found together) will remain sometimes for fully an hour searching among the boughs and foliage for insects, the male every now and then uttering its flute-like whistle, *chee-tooo*, which imparts to the attentive listener the idea that the little bird must be in a very contented frame of mind! It is fond of open groves of trees, the edge of jungle, and vegetation at the sides of roads, and it is very partial to the low scattered jungle bordering the sea-shore on the north coast. Occasionally several pairs may be seen frequenting the same tree; but it is not usual to find more than one couple together. It is of a restless disposition, hopping actively about the leaves in search of its food, and often clinging, like a Tit, to a slender twig while scrutinizing the surrounding foliage. In its mode of flight it differs from all its family: owing, perhaps, to the fluffy nature of its long flank-feathers, it appears to have no little difficulty in acquiring speed on the wing; and its flight is at best laboured, being performed merely from one tree to the other with a quick beating of its wings and a dipping motion of the body, which combine to produce a whirring sound.

I have occasionally seen it dart out and seize a passing moth or butterfly on the wing, and alighting again swallow it whole, a habit which is testified to by the large Mantidæ and other winged insects which are often found in its small stomach. While in the black plumage the male presents a very handsome appearance, his black back contrasting with his brilliant yellow breast, and when he darts from one tree to another, puffing out while on the wing his long white flank-plumes, looks more like a ball of feathers than any thing else. Jerdon remarks that the natives in the south of India state that this species repeats the words "*Shoubhiya, Shoubhiya*" before rain.

Nidification.—I have found the nest of the Bush-creeper in the north of Ceylon in July; but, if different districts be considered, I believe it breeds all the year round, as males may be found in the black plumage at all seasons. It builds at about 15 or 20 feet from the ground, attaching its beautiful nest to the upperside of a small horizontal bough, generally near a fork, but sometimes, according to Mr. Hume, between one or two upright twigs. It is a symmetrical, rather deep cup, with thin, steep, and compact walls, and is usually made of cotton woven in with fine grass or very slender tendrils of plants, the bottom being attached to the bark by cobwebs, which also adorn the neatly finished top; the interior is roomy and the bottom rather flat, the cavity measuring about 2 inches across. I have found several nests, but only one with eggs: the number was two; they were broad, stumpy ovals, of dirty white or whitish-grey ground-colour, openly blotched with large longitudinal faded brownish spots. My eggs got broken in travelling, and I therefore lack measurements; but Mr. Hume gives the average size as 0·69 by 0·54 inch; and the same author, in his 'Nests and Eggs,' says that the eggs are at times pink or salmon-colour, with *reddish*-brown blotches, which are chiefly confined to the large end, forming there an imperfect zone.

PASSERES.

Fam. TIMALIIDÆ.

Bill curved, compressed, higher at the base than wide. Nostrils placed in a membrane bordered by setaceous feathers. Wings short and rounded. Tail moderately lengthened. Legs and feet strong, with the tarsus longer than the middle toe and scutellate in front; the hind toe and claw large.

Plumage often lax, and in many silky beneath. Insectivorous in diet.

Subfam. TIMALIINÆ.

Wings rounded, with the 1st quill moderately developed, the secondaries long. Tail of 12 feathers, usually lengthened and graduated. Legs and feet stout and large. Toes stoutly scaled, the outer and the middle slightly syndactyle.

Plumage mostly lax. Of gregarious and very active habit.

Genus MALACOCERCUS.

Bill moderately long, compressed, the base higher than wide; culmen well curved; rictal bristles scanty. Wings short, rounded, the 1st quill half the length of the 5th, which is the longest; secondaries almost equal to the longest primaries. Tail graduated, rounded at the tip. Legs and feet strong. The tarsus covered with broad smooth scutæ, becoming obsolete with age. Toes stoutly scaled.

MALACOCERCUS STRIATUS.

(THE COMMON BABBLER.)

Malacocercus striatus, Swains. Zool. Ill. 2nd ser. pl. 127 (1833); Jerdon, B. of Ind. ii. p. 59 (1863); Blyth, Ibis, 1867, p. 300; Holdsw. P. Z. S. 1872, p. 449; Legge, J. A. S. (Ceylon B.), 1870–71, p. 39; Hume, Str. Feath. 1876, p. 458.

Malacocercus bengalensis, Kelaart, Prodromus, Cat. p. 122 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 271.

The "Seven Brothers" (so called from its associating in flocks of six or seven), *Dust-bird, Dirt-bird, Dung-Thrush, Mud-bird,* Europeans in Ceylon. *Pastro manduco*; *Pastru bragaru* (Layard), Portuguese in Ceylon.

Demelitcha, Sinhalese; *Punil*, Tam. (Layard).

Adult male and female. Length 9·0 to 9·2 inches; wing 4·0 to 4·2; tail 4·0; tarsus 1·3; middle toe and claw 1·0 to 1·05; hind toe and claw 0·8; bill to gape 0·95 to 1·0.

Iris white, or white faintly tinged with green; bill fleshy white or yellowish white; legs and feet sickly yellow or whitish in some, tinged in parts with yellowish; eyelid yellowish.

Head, upper surface, entire neck, and chest brownish ashy grey, the brown portions of the feathers being darkest on the lower part of the hind neck, interscapular region, and chest; the edges grey, contrasting with the dark hue, many of the feathers likewise with pale mesial striæ; the wing-coverts more uniform than the back; quills and terminal portion of tail-feathers glossy brown, the outer webs of the former pale greyish at the edges, showing conspicuously when the wing is closed; basal part of tail olive-grey, and the dark portion cross-rayed with the same hue, which gradually blends into the brown; lores greyish; lower breast, belly, and under tail-coverts pale rufescent, blending into the brownish grey of the chest and flanks; under wing-coverts tinged with rufescent, the inner edges of the quills at the base of the same hue.

Individuals vary *inter se* in the amount of cross-raying of the tertials and tail-feathers; but this character is always most perceptible when the feathers are new; it is plainly indicated in the back-feathers of some examples.

Young. Immature birds are very similar to adults. Mr. Holdsworth remarks that the depth of the striæ varies with age, and that in a well-grown young bird there is not a trace of striæ on the tertiaries, and they are very indistinct on the tail.

Obs. This Babbler is not very aptly named *striatus*, for this term is usually held to signify longitudinal lines or central streaks to feathers; in the present case, however, it was applied by Swainson to the species in question to denote the transverse rays which cross the scapular, tertial, and tail-feathers, and which is a prevailing character in this family of Thrushes. His figure (pl. 127, 2nd series, of his 'Illustrations') represents these transverse striæ more pronounced than they ever really are; for in the drawing they appear as *black* lines, well defined, on a greyish-brown ground. It would appear that the name existed in a MS. form prior to Swainson's description of the species; he writes of it, "The present species we received from Ceylon, but without any notice of its habits; and the specimen is in the Paris Museum, under the manuscript name of *Gracula striata*, from the circumstance of the scapular quills and also the tail-feathers being marked with transverse lines of a darker brown, varying in intensity according to the rays of light."

This species is very closely allied to *M. malabaricus*, the Jungle-Babbler, found in the peninsula of India. It was formerly thought to be peculiar to the island, but specimens in my collection from Ramisserum Island are not to be separated from Ceylonese examples; they measure from 3·95 to 4·2 in the wing; the lower parts and under wing are slightly more fulvous than the Ceylonese, and the tail-feathers are faintly tipped with the same; in one specimen the lateral pair have a very distinct rufescent tip; as regards striæ and the pale wing-edging, they are identical. Two specimens received from the same locality are partial albinos.

M. terricolor, the Bengal Babbler, has the brown of the back and wings more ruddy than in *striatus*, and the under surface paler; the throat is grey, passing into sandy fulvous on the chest, and thence into a more albescent hue on

the lower breast, abdomen, and under tail-coverts; the feathers of the chest are pale-centred. This species varies from 3·9 to 4·2 inches in the wing.

M. griseus has been said by Blyth to have been found in Ceylon; but his remark, contained in Kelaart's 'Prodromus,' does not seem to refer to it, as he says the head is concolorous with the rest of the upper surface; whereas in this species the head is very pale grey, and the throat dark brown and grey; the quills and tail are very dark towards the tips of the feathers. The wing of a Deccan specimen measures 3·8 nearly.

Distribution.—The "Dust-bird," or "Dung-Thrush," as it is commonly called in Ceylon, is found throughout the whole low country from the Jaffna peninsula and north-west coast, where it is very abundant, down both sides of the island to the extreme south. It is more numerous in low scrub or open bushy plains and in cultivated districts than in the wilds of the forest tracts; but it is so universally distributed that it may chance to be found anywhere. It ascends, on the northern side of the Kandyan Province, into Dumbara and all the district round the hill-capital, but does not range in that district above 3000 feet, at which it is not very common. In Uva and the great patna-basin between Fort MacDonald and Haputale it is not unfrequent as high as 4500 and 5000 feet. Kelaart records it in his list of Nuwara-Elliya birds; but neither Mr. Holdsworth nor Mr. Bligh have ever observed it there; although it might find its way in the dry season up the Hakgala pass, on the lower part of which, about Wilson's Bungalow, I have myself seen it.

It is found in the island of Ramisserum and on the adjoining mainland of India; but how far it extends northward in the Madras Presidency I am unable to say.

Habits.—The number of popular names (some of them by no means euphonious) which are bestowed upon this bird amply testify to the familiar acquaintance which Europeans have with it. It is, perhaps, the best known of all our feathered friends, save the impudent little Sparrow—as much at home in the tropics as in England—and the Common Bulbul, which enlivens every compound in the suburbs of Colombo; it is, in fact, found in every variety of situation, from the grounds of the English bungalow to the wilds of the interior, evincing no fear whatever of man, and from its habit of dusting itself by the sides of roads and in the most public situations it has acquired one of its best-known names. Its extreme sociability, causing it to associate in a little flock of a certain number, generally six or seven, has given it another of its sobriquets, "The Seven Brothers," and is the most interesting feature in its economy, bringing out in a striking manner the curious habits of which it is possessed. The antics which these little troops perform, often a few yards from the verandah of a bungalow, are well known to the most casual observer, and are best described, to those who have never seen it in a state of nature, by saying that, when performing them, these singular birds exhibit all the symptoms of being charged with electricity! While two or three jump to and fro on the dusty road, shooting out their wings and twitching their tails from side to side, several more, who are perched on the branches above, peer down on their comrades with no little interest, uttering a scarcely audible whistling, and then suddenly commence a spasmodic series of springs and up-dartings of the wings and tail, jumping round on their perches, and uttering loud screams, until, at a given signal, all is silence and repose. On being alarmed, the whole flock decamp, each bird scudding along after its mate to the next tree, where the same performances are again repeated. It is a systematic bird in its movements. I noticed, while living at Colombo, that a troop, which inhabited the Queen's-house Gardens, sallied out, and journeyed by degrees along an adjacent row of Suriah-trees at the same hour every day, and that they were peculiarly lively after a shower of rain. Its food is entirely insectivorous, and is mostly taken by scratching among leaves and débris on the ground. The cinnamon-gardens at Colombo are a favourite resort of these birds; they delight in the leafy Cadju-trees (*Anacardium occidentale*), which afford them shade during the heat of the day, while the thick bushes are an immediate shelter when they are disturbed while seeking their sustenance on the ground. Plantations of young cocoanuts are never without these flocks of Dust-birds, which delight in the grand platforms afforded them for their dances by the broad fronds of these graceful palms.

Layard writes as follows of this bird:—"They are always seen in small parties varying from three to seven, according to the number of young ones in a nest, which seem to remain with their parents until the period of incubation again commences, when they separate to form families of their own. When alarmed, an old bird utters a piping note, making several prodigious hops, and takes to flight; his example is followed by all the rest in succession, and the whole party wing their way in a long file, alternately beating the air with heavy strokes, or sailing along on their rounded wings to a place of safety."

Nidification.—The breeding-season of the "Seven Brothers" lasts from March until July. The nest is placed in a cinnamon-bush, shrub, or bramble at about 4 feet from the ground, and is a compact cup-shaped structure, usually fixed in a fork, and made of stout grasses and plant-stalks, and lined with fine grass, which, in some instances I have observed, was plucked green. The interior measures 2½ inches in depth by about 3 in width. The eggs are two or three in number, small for the size of the bird, glossy in texture, and of a uniform opaque greenish blue. They measure from 0·91 to 1·0 inch in length, by 0·7 to 0·74 in breadth.

KELAARTIA PENICILLATA
MALACOCERCUS RUFESCENS

MALACOCERCUS RUFESCENS.

(THE RUFOUS BABBLER.)

(Peculiar to Ceylon.)

Layardia rufescens, Blyth, J. A. S. B. 1847, xvi. p. 453; Jerdon, B. of India, ii. p. 67 (1863); Holdsworth, P. Z. S. 1872, p. 449; Blyth, Ibis, 1867, p. 300; Legge, ibid. 1874, p. 18; id. Str. Feath. 1875, p. 368.

Malacocercus rufescens, Blyth, Cat. B. Mus. A. S. B. p. 141 (1849); Kelaart, Prodromus, Cat. p. 122 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 271.

The Red Dung-Thrush, Red Jungle-Thrush, Europeans in Ceylon.

Rattu demelitchia, Parandal kurulla (Saffragam), also *Panderella, Kala parandal*, Sinhalese.

Suprà sordidè fulvescenti-brunneus, tectricibus alarum dorso concoloribus: remigibus brunneis extùs dorsi colore lavatis, secundariis magis rufescenti-brunneis: rectricibus sordidè rufescenti-brunneis, fulvescenti-brunneo marginatis: pileo nuchâque magis grisescenti-brunneis; loris rufescenti-fulvis: facie laterali et gulâ rufescenti-brunneis vix vinaceo lavatis: pectore fulvescenti-rufo: corpore reliquo subtùs saturatè brunneo vix rufescente: subalaribus fulvescenti-rufis: remigibus infrà brunneis intùs fulvescentibus: rostro aurantiaco, basaliter saturatiore: pedibus saturatè flavis: iride albâ; palpebrâ virescenti-flavâ.

Adult male and female. Length 9·3 to 10·8 inches; wing 4·0 to 4·2; tail 4·2 to 4·6; tarsus 1·3 to 1·4; mid toe and claw 1·05 to 1·1; bill to gape 1·0 to 1·1; hind toe 0·55, claw (straight) 0·37.

The above limit of length is that of an exceptional bird, as 10·5 inches is rarely exceeded.

Iris white, yellowish white, or greenish white; bill orange-yellow, deepest on the basal half; legs and feet dull chrome-yellow; claws yellowish horn; orbital skin and eyelid pale greenish yellow.

Forehead and head greyish brown, deepening on the hind neck into the brownish rufous of the whole upper surface and wings; quills edged with greyish; tail deeper rufous than the back, and crossed, as are likewise the tertials, with faint rays; beneath dull ferruginous, slightly greyish on the chin and the flanks; sides of belly and under tail-coverts shaded with brown; lores and cheeks concolorous with the throat; ear-coverts brown, with pale striæ.

Young. Birds of the year have the chin and gorge greyer than adults, and the lower parts are pervaded with a brownish hue. Iris as in the adult.

Obs. This species is closely allied, as regards colour, to the South-Indian *Layardia subrufa*, which has the upper mandible brownish, the forehead ash-colour, and the upper surface rufous-brown, with a tinge of olive in it; the tail is darker rufous, and the throat and fore neck brighter than in the Ceylonese bird. Besides having the frontal feathers remarkably stiff, it has the bill more curved than in either the Grey Babblers of India or the present species, and is quite worthy of being placed as a subgenus of *Malacocercus*, as, in addition to the characteristics alluded to, it has the wings much shorter in proportion to the tail. The Ceylonese bird, however, does not differ from typical *Malacocercus* sufficiently to be separated as *Layardia*, which has usually been done, the only differences existing being that the bill is slightly deeper and the 3rd quill a little shorter; I have therefore removed it into the former genus. The wing, in an example of *L. subrufa* in the national collection, measures 3·5 and the tail 5·0 inches.

Distribution.—This Babbler was discovered by Dr. Templeton, R.A., a gentleman who, as before remarked, did considerable work in the ornithology of the island during his tour of service in it prior to 1850. Its range is somewhat restricted, extending over the western and damp portion of the Southern Province, and through the western highlands to the main range. In the Colombo district it is not found nearer the sea than Killapana, at which point the country becomes wooded; from there, throughout the whole interior of

the province, to Saffragam, and thence through the Kukkul and Morowak Korales to the subsidiary hills, through which the Gindurah and Niwelle rivers flow, it is very common. It ascends the slopes of the wilderness of the Peak to the extreme limits of the forest, and ranges through the vast jungles reaching thence to Horton Plains and Nuwara Elliya, throughout which latter district it is tolerably common. Mr. Holdsworth only observed it there in the cool season; but I am inclined to think it is resident there, as I have obtained it in a state of breeding at the top of Totapella, and in the Peak forests I have shot it at great altitudes in the height of the south-west monsoon. It is very abundant about Kaduwella and Hanwella, and in the bamboo-scrubs of the Raygam and Hewagam Korales; but north of the Kelaniganga its numbers begin to diminish, and I do not know of its occurrence beyond Kurunegala. I have never seen it in any of the eastern highlands, nor in the low country south of Haputale, its range on that side not extending beyond the limits of the wet south-west hill-region at Tangalla.

Habits.—The Red Jungle-Thrush frequents thickets in the vicinity of cultivation, bamboo-scrub (to which it is as much, if not more, partial than any of our Babblers), thick jungle, and primeval forest. At times it associates in large troops, and, as a rule, lives in parties of not less than a dozen, resembling, in these respects, the Laughing Thrush more than its other congeners. It is very sociable, actively working about the lower limbs of trees, and threading its way through the branches of low jungle in close fellowship, keeping up a conversational, harsh chattering, and moving on from tree to tree without separation. It has the quick movements of the last species, jerking up its wings and tail, and restlessly jumping to and fro on its perch, when engaged in parleying with its companions. Its notes resemble those of *Garrulax* more than *Malacocercus*, and it seems not to indulge in long periods of silence, as does the latter; but a continual low babble proceeding from the flock usually betrays its whereabouts in the jungle. Its flight is not quick, and is performed with vigorous beatings of the wings, simply to enable it to proceed about in search of its food from tree to tree. I found the stomachs of several examples killed in the month of August to contain portions of a large black beetle which was affecting the jungle in great numbers at the time. When located in damp timber-forest, such as the Peak, Pasdun-Korale, and Kukkul-Korale jungles, it appears not to associate with any other species: a solitary flock is often met with after walking through the forest for some distance without seeing a single bird or even hearing a note; notwithstanding the little troop is all life and animation, isolated as it is in the gloomiest recesses of the primeval wood, its members busily engaged in twitting from branch to branch, while they keep up a sociable chattering as if they rejoiced in the loneliness of their retreat.

Nidification.—This bird breeds in the Western Province in March, April, and May, and constructs a nest, similar to the last, of grass and small twigs, mixed perhaps with a few leaves, and placed among creepers surrounding the trunks of trees or in a low fork of a tree. It conceals its habitation, according to Layard, with great care; and I am aware myself that very few nests have been found. It lays two or three eggs, very similar to those of the last species, of a deep greenish blue, and pointed ovals in shape—two which were taken by Mr. MacVicar at Bolgodde measuring 0·95 by 0·75 inch, and 0·92 by 0·74 inch.

The figure in the Plate accompanying this article represents a male bird of this species from the Western Province.

Genus GARRULAX.

Bill straighter than in the last genus; culmen straight at the base, gonys-angle pronounced. Nostrils oval, placed well forward and exposed. Wings longer than in *Malacocercus*, the 3rd quill much shorter than the 4th, the 5th and 6th the longest. Tail rather long, graduated and lax. Legs and feet very stout. Tarsus shielded with three wide scutæ. Hind toe and claw very large.

GARRULAX CINEREIFRONS.

(THE ASHY-HEADED BABBLER.)

(Peculiar to Ceylon.)

Garrulax cinereifrons, Blyth, J. A. S. B. 1851, xx. p. 176; Kelaart, Prodromus, Cat. p. 122 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 270; Blyth, Ibis, 1867, p. 300; Holdsw. P. Z. S. 1872, p. 448; Legge, Ibis, 1874, p. 20.

Laughing Thrush, The Ashy-headed Garrulax, Kelaart.

Ad. suprà brunneus, alis dorso concoloribus, primariis externis grisescenti-brunneo lavatis: rectricibus brunneis, extùs rufescenti marginatis: pileo nuchâque cinereis, hâc brunneo lavatâ: loris et facie laterali totâ cinereis: genis et corpore subtùs toto rufescenti-fulvis, abdomine pallidiore: mento ipso albido: subalaribus rufescenti-fulvis: remigibus infrà brunneis intùs fulvescentibus: rostro nigro: pedibus plumbescenti-nigris: iride albâ.

Adult male and female. Length 9·6 to 10·0 inches; wing 4·4 to 4·8; tail 4·0 to 4·3; tarsus 1·4 to 1·5; mid toe and claw 1·25 to 1·3; hind toe 0·6, claw (straight) 0·45; bill to gape 1·25.

Iris white; eyelid plumbeous; bill black, inside of mouth greenish yellow; legs and feet plumbeous brown; claws dusky horny; posterior part of tarsus bluish.

Lores, face, and head ashy or cinereous grey, blending at the nape into the rufous-brown of the sides of the neck, upper surface, wings, and tail; the first 3 or 4 primaries with a pale edge, and the inner webs of the quills brown; tail deeper in hue than the wings; chin albescent, blending into the fulvescent rufous of the fore neck and under surface; abdomen more fulvescent than the breast, the concealed portion of the feathers there being albescent; flanks and under tail-coverts dusky rufescent brown; lower feathers of the thighs cinereous, under wing-coverts rufous. On the centre of the throat the colour is brighter than elsewhere.

Young. Iris dull grey, with a dark outer circle; bill black, the gape and base of lower mandible yellowish; eyelid greenish yellow; legs and feet olivaceous brown, soles yellowish fleshy, claws yellowish horn.

Forehead and head as in the adult, the nasal plumes dark, and the grey of the crown not continued so far back; the back is deeper rufous than the adult, and the wing-coverts likewise are more intense; chin not so white and the throat and under surface more fulvescent. In the first plumage the feathers of the chest and breast are fluffy. This dress appears to be quickly put off, and in the next stage or yearling plumage the iris is pearly grey or in some white, with a tinge of reddish; gape and eyelid yellow; legs and feet bluish brown. There is scarcely any perceptible difference in the grey of the occiput, but the fore neck is paler or more fulvescent.

Obs. G. delesserti, the Wynaad Laughing Thrush, is allied to the present species. Mr. Bourdillon's dimensions of a specimen in the flesh are:—Length 9·0 inches, wing 4·3, tail 4·0, tarsus 1·45. It differs from *G. cinereifrons* in having the under mandible yellow at the base, and the fore neck and breast white, changing into cinereous grey on the flanks.

Distribution.—The Ashy-headed Babbler was discovered by Dr. Kelaart; it is not recorded in what district he found it first, for Layard only writes of it as follows:—"I do not know where he (Kelaart) found it; but I obtained several specimens along the banks of the Kaluganga, about forty miles inland from Kalatura,

and one at Pallabaddoola in the Peak range." I infer, however, that the Doctor first made its acquaintance in the Central Province, in the damper forest of the western portion of which it is found. I have seen it in the Deltota district and in the Peak forests, and I have no doubt it occurs in Dumbara and many places between Kandy and the Peak range; but being an inhabitant of humid inaccessible jungles, it is less often met with than any of its family. I have not seen it above 3500 feet; but Kelaart speaks of it as being found at Nuwara Elliya; but whether it has erroneously found a place in his list of birds from that place I do not know; suffice it to say that no one else, that I am aware of, has heard of it from so high an elevation, although there is no reason why it should not be found there as well as the Rufous Babbler (*Malacocercus rufescens*). It inhabits the forests of the southern ranges, and all the heavy jungles from the Kukkul Korale to the Kaluganga. I have procured it in the Singha-Rajah forest, in the Pasdun Korale, and also in the Ikkade-Barawe forest, which is only 18 miles from Colombo; there are likewise specimens in the British Museum collected by Mr. Chapman at a place called Dusiwella, which I believe is in the Western Province. It does not appear to inhabit the jungles of the south-eastern portion nor the eastern and northern divisions of the island: the Kurunegala district, as far as is known at this time, forms its northern boundary; and therefore its distribution is one of the most restricted of any of the peculiar Ceylonese species.

Habits.—This Laughing Thrush has a similar disposition to the Wynaad species, loving the gloom and shade of the dampest forests in the island, and delighting in the seclusion afforded by the thick underwood and not unfrequently dense bamboo-thickets with which such localities abound. I once met with it in a dark ravine in the very gloomiest recesses of the lofty timber-jungles of the Kukkul Korale; not the least daunted by the tremendous downpour of rain which was falling at the time, the whole troop were darting hither and thither about the dripping vegetation in search of food, and indulging in their wonted spasmodic cries, as if rejoicing in the brightest sunshine on a pleasant lawn, instead of being imprisoned in the darkest, most dripping, leach-infested glen in Ceylon! It always associates in scattered troops of ten or twenty, and feeds amongst tangled underwood, in spots which are covered with dead leaves, the product of many years' dropping from the monarchs of the forest, and delights in exploring the mossy recesses of fallen trunks, in which humid spots it finds an abundance of caterpillars, bugs (*Hemiptera*), and coleopterous insects. It breaks out constantly into a harsh chattering, which is taken up in turn by all the members of the troop, and as suddenly stopped, when all is silent again, until some trifling alarm sets the garrulous converse loose. This chattering is usually finished up with a hurried sort of scream. Like the last species, it is very active in its gestures and not at all shy, being very loath to break up its party when fired at, some members of it being occasionally bold enough to fly down to and hop about their fallen comrades with loud cries and vigorous flapping of their wings, while the rest mount on to the topmost branches of low trees, and jerk themselves to and fro, peering down on their assailant, and executing a series of spasmodic antics. It shuns the society of other birds, appearing to affect spots so gloomy and damp as to be avoided by all species, except, perhaps, the Rufous Babbler and the little Quaker-Thrush; and in these sylvan retreats it would no doubt often be passed over unnoticed, were it not for its garrulous habit, which is usually provoked when it hears the approach of danger. The stomach of this bird is very muscular, and I have often found it contain a quantity of foul black liquid.

Nidification.—The breeding-season of this bird is from April till July. Full-fledged nestlings may be found abroad with the parent birds in August; and from this I base my supposition, for I have never found the nest myself. Intelligent native woodmen, in the western forests, who are well acquainted with the bird, have informed me that it nests in April, building a large cup-shaped nest in the fork of a bush-branch, and laying three or four dark blue eggs. Whether this account be correct or not, future investigation must determine.

The lower figure in the Plate accompanying the next article represents a female of this species, shot in the Ikkade-Barawe forest.

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POMATORHINUS MELANURUS.
GARRULAX CINEREIFRONS.

Genus POMATORHINUS.

Bill long, curved, compressed from the nostrils to the tip, which is entire. Nostrils lengthened, the membrane overlapping them. Wings short, rounded, the 5th and 6th quills the longest, the 1st about half their length. Tail moderately long, lax, and graduated. Legs and feet stout. The tarsus longer than the middle toe, the scutæ smooth and large. Middle toe considerably longer than the laterals; hind toe and claw large.

POMATORHINUS MELANURUS.

(THE CEYLONESE SCIMITAR-BABBLER.)

(Peculiar to Ceylon.)

Pomatorhinus melanurus, Blyth, J. A. S. B. 1847, xvi. p. 451; id. Cat. B. Mus. A. S. B. p. 146 (1849); Kelaart, Prodromus, Cat. p. 122 (1822); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 271; Blyth, Ibis, 1867, p. 301; Legge, J. A. S. (Ceylon Branch) 1870–71, p. 41; Holdsw. P. Z. S. 1872, p. 447; Hume, Str. Feath. 1873, p. 437; Legge, Ibis, 1874, p. 18, et 1875, p. 395; id. Str. Feath. 1876, p. 245; Whyte, ibid. 1877, p. 202; Ramsay, Ibis, 1878, p. 132.

The Black-tailed Scimitar-Babbler, *The Ceylon Pomatorhinus* (Kelaart); *The Gamut-bird* in Planting-districts.

Batitchia, Sinhalese, Galle district; *Parandeliya*, Western Province.

♀ *ad.* suprà rufescenti-brunnea, pileo obscuriore, fronte et verticis lateribus nigricantibus: tectricibus alarum dorso concoloribus: majoribus remigibusque saturatè brunneis, extùs rufescenti-brunneo marginatis, secundariis latiùs: rectricibus chocolatinis, rufescenti-brunneo marginatis: strigâ superciliari latâ a basi rostri usque ad nucham lateralem productâ: palpebrâ albâ: loris, plumis infraocularibus et regione paroticâ nigris: colli lateribus castaneo lavatis: genis et corpore subtùs albis, lateribus et subcaudalibus rufescenti-brunneis: tibiis cinerascentibus: subalaribus cinerascenti-brunneis, axillaribus albis apicaliter brunneis: remigibus infrà brunneis, intùs pallidè rufescentibus: rostro flavo, ad basin mandibulæ nigricante: pedibus fuscescenti-schistaceis: iride brunneâ.

Adult male. Length 8·6 to 8·9 inches; wing 3·5 to 3·8; tail 3·5 to 3·7; tarsus 1·2; middle toe and claw 0·95 to 1·05; hind toe 0·6, its claw (straight) 0·4; bill to gape (straight) 1·13 to 1·23.

Adult female. Length 8·5 to 8·7 inches; wing 3·2 to 3·6; tail 3·4 to 3·6; tarsus 1·2; bill to gape (straight) 1·1 to 1·2.

Examples vary *inter se* in size, but there is no constant difference between low-country and hill birds. Dimensions of various specimens are as follows:—♂ (Karawita hills, Saffragam), wing 3·6, bill to gape (straight) 1·26; ♂ (Dumbara), wing 3·6, bill to gape (straight) 1·2; ♂ (Horton Plains), wing 3·65, bill to gape (straight) 1·15; ♂ (Banderawella, Uva), wing 3·61, bill to gape (straight) 1·2; ♂ (Borella, Colombo), wing 3·55, bill to gape (straight) 1·2.

The bill varies in length and curvature according to age.

Iris brownish red, dull red, or reddish brown; orbital skin and eyelid dull blue; bill gamboge-yellow, more or less blackish from the forehead to a short distance in front of the nostril; legs and feet plumbeous or greenish plumbeous; feet generally more bluish than tarsi; claws dusky, pale horn at base.

Lores, region beneath the eye, ear-coverts, forehead, and plumes bordering the supercilium above black, fading into the dark olivaceous of the head and occiput, the crown-feathers having black shafts; a conspicuous superciliary stripe extending from the nostril to beyond the nape, throat, fore neck, chest, and breast pure white, passing up behind the ear-coverts; hind neck, upper surface, wing-coverts, flanks, and under tail-coverts ferruginous brown, more intense on the back of the neck than elsewhere; in many examples the feathers on the sides of the neck and chest at the

junction of the white with the brown hue are centred with the former; quills with the outer webs more olivaceous than the back, and the inner webs blackish brown; tail blackish brown, edged at the base with the hue of the upper tail-coverts, and deepening to blackish at the extremity; there are indications of cross rays on the terminal half, which show plainer beneath; abdomen rusty olivaceous. In some examples the hue of the nape blends imperceptibly into that of the hind neck, in others the line of demarcation is plain.

The above is a description of the generality of examples from the Western Province, the south-west corner of the island, the Pasdun-Korale hills, and the lower parts of the Peak forests, where a ferruginous hue predominates.

As this bird ascends from the low country to the hills and to a cooler and drier climate than exists in the south and west, the rusty hues gradually vanish, giving way to olivaceous tints; and examples from the upper zone, and likewise from the Uva patna-district, are clothed as follows:—Upper parts, flanks, and wings (that is, those parts which in the low country are ferruginous) olivaceous brown, faintly tinged with rusty on the sides of the hind neck and on the rump. The same white-centred feathers on the sides of the chest exist in some hill specimens. Soft parts the same, the legs, perhaps, slightly greener. The most ferruginous birds come from the damp districts of the south, where moist climate and heat are combined; and the gradation from their plumage to that of hill birds from the upper zone is very perfect, a complete sequence being obtainable on going up through the wilderness of the Peak from the low-lying portion of Saffragam to the Horton Plains. Examples, however, vary in the olivaceous character of the brown tints *inter se*. It must not be supposed that the greenest birds come from the highest elevations: a specimen from Totapella, 7800 feet, is very strongly tinged with rusty, and so is another from Kandapolla, 6300 feet, while an individual from Banderawella and another from Dumbara are more olivaceous than either. In like manner the ferruginous birds of the Western Province do not vary regularly according to elevation, the most intensely-coloured bird in my collection being from the neighbourhood of Gillymally. Birds from the forests of the north are very similar to Central-Province specimens, not in any way partaking of the rusty character of those from the south-west.

Young. A bird in nest-plumage, shot at Nuwara Eliya, is very ferruginous above, and likewise on the sides of the chest and flanks; the head and ear-coverts are not so black as in the adult, and the white of the chest is very much contracted, and does not extend so far down upon the breast. The bill is much straighter than in an adult.

Obs. The difference between the Western-Province and the hill race of this bird (if I may use the term) has been the subject of some attention. Mr. Holdsworth was almost of opinion that they merited specific distinction; and Lieut. Wardlaw Ramsay, in his synopsis of the genus *Pomatorhinus*, published in 'The Ibis,' April 1878, has likewise made some remarks on the subject, based on an examination of the specimens (probably a small series) in Lord Tweeddale's collection: he writes that "the small race which is found at Nuwara Elliya has the back olive-brown, without being in the least rufescent, whilst the larger race," found in the Western Province, "has a few of the lateral breast- and flank-feathers partially white or centred white." But I have shown that the hill race is not smaller than the low-country, and that the white-centred feathers exist in both. This latter is, I imagine, merely a transition-feature towards an extended development of the white of the chest. A specimen in my collection has white feathers even in the wing-coverts and on the hind neck. The example measured by Lieut. Ramsay from Nuwara Elliya, with the wing 3·2 inches, must have been a female, which is no smaller than a low-country bird of the same sex. The most pointed difference between the two races lies, perhaps, in the more plainly contrasted black of the head of the up-country bird with the olivaceous of the hind neck. The same variation in the brown tinting of these Babblers is to be found in the case of the smaller relative (*Alcippe nigrifrons*) of the present bird, and likewise in another bird of the same family (*Pellorneum fuscicapillum*). The Ceylonese Scimitar-Babbler is allied to the South-Indian species (*P. horsfieldi*); this latter is larger, with the wing 3·8 to 3·95; it is not so black on the forehead, and the upper surface and wings, together with the sides of the breast, are brownish olivaceous; the white of the chest does not descend further than the upper part of the breast, suddenly narrowing to a point; the sides of the breast are black. Lieut. Wardlaw Ramsay, in his above-mentioned synopsis of this genus, remarks that our bird is intermediate between *P. schisticeps* and *P. montanus* of Java. It is not, however, so closely allied to either as to *P. horsfieldi*. The Javan bird is a different type of *Pomatorhinus* from ours, being characterized by the sudden contrast between the plumage of the head and back. It has the head and nape dark slate, most intense on the forehead, while the sides and lower part of the hind neck, together with the scapulars, are rich rust-colour; tail dusky brown; the throat, fore neck, and breast are white, and the flanks concolorous with the back. Examples from Java, in the British Museum, measure 3·4, 3·35, 3·5 in the wing. The Bornean race has been separated by Cabanis, as being smaller than the Javan, and having the secondaries and tail not so rusty-coloured. I have examined specimens of this species, and believe it to be only entitled to rank as a local race. One example measures 3·45 inches in the wing, which exceeds two of the above dimensions of *P. montanus*.

P. schisticeps, from the Himalayas, has the head and nape dark slate-colour, and the upper surface olive-green: the throat and breast are white, and the sides of the fore neck rusty-coloured, with white streaks.

Distribution.—The Scimitar-Babbler, one of the most interesting Ceylonese species, is widely distributed throughout the central and southern hills, but is by no means a mountain bird, being equally common in the interior of the Western Province, more especially in the bamboo-district of Saffragam and the circumjacent country, and likewise in the south-west hilly region. As regards the Kandyan Province, it is a very abundant bird in the main range up to the highest altitudes, and is one of those comparatively few species met with in the woods on the Horton Plains. The same may be said of all the intermediate coffee-districts and the wooded patnas throughout the Province. It is common in the forests of the south-east and on the Batticaloa side, and is seattered pretty freely throughout all the northern forest-tract, its numbers diminishing along the central road, when the latitude of Kokelai on the east and Manaar on the west is reached. I have obtained it as close to Colombo as the neighbourhood of Borella.

Habits.—This wood-loving bird frequents shady dark forests, patna-woods (particularly in the vicinity of streams), bamboo-cheenas, low jungle, and almost every variety of thick cover. It usually associates in pairs, but occasionally fraternizes, and goes about in small companies, searching for its insect-food on low branches, or clinging, Woodpecker fashion, to the trunks or large limbs of trees, about which it jumps and twists itself with considerable agility, proceeding easily upwards with active hops. Early in the morning, while searching among thick underwood for its food, it repeatedly gives out its far-sounding, melodious call, which must be familiar to all who have travelled in the Ceylon jungles, although few are acquainted with the owner of the remarkable voice, proceeding, as it usually does, from dense thickets. The note may be likened to the words *chock off you poor boy*, or *wok wok ek ek wok*, which is answered by the female with a more hurried scale resembling *wok off*. While pouring out these voluble notes, the birds are all the time on the move, attentively scrutinizing every dead leaf or rotten stick in their way. Mr. Bligh has observed them in the breeding-season puffing out the feathers of the chest and bowing to each other; and I have noticed that they were of an inquisitive nature, alighting close to me when they have chanced to espy me watching them in the stillness of the forest, and stretching out their heads for a closer inspection of such an unexpected intruder! Mr. Holdsworth remarks that they are very noisy in the pairing-time, and refers to the powerful notes of the male as having acquired for the species the name of "Gamut-bird."

I subjoin the following note on the habits of this bird, which Mr. Bligh has sent me from Haputale:—"A family reared near my bungalow roost in the thick fir-tree near the bedroom-window. At early dawn I often see them 'getting-up;' they hop from out of the thick tree to the open branches of a large oleander, and, like a higher order of beings, commence to dress themselves, preening and ruffling out their feathers all the time, chattering a little, as if of arrangements for the day: the male often repeats something like *twoi, twoi, twoi*, in various keys, swelling out its beautiful white throat considerably each time. The young ones have a plaintive mew-like call when following the old ones for food, and they often make a great clamour when being fed. I once came upon about ten adults, having been attracted by a great noise they made, and found them in a group on the bole of a large tree felled in the jungle. It was a most comical sight to see these excited birds with throats extended like a pigeon, wings lowered and spread, and tail the same, but often elevated, all advancing to a common centre by a quick jerking hop, then retreating backwards, and bowing their bodies the whole time; this went on for a few minutes until I disturbed them; it was a veritable *Pomatorhinus*-quadrille!"

Nidification.—This Babbler breeds from December until February. I have observed one collecting materials for a nest in the former month, and at the same period Mr. MacVicar had the eggs brought to him; they were taken from a nest made of leaves and grass, and placed on a bank in jungle. Mr. Bligh has found the nest in crevices in trees, between a projecting piece of bark and the trunk, also in a jungle path-cutting and on a ledge of rock; it is usually composed of moss, grass-roots, fibre, and a few dead leaves, and the structure is rather a slovenly one. The eggs vary from three to five, and are pure white, the shell thin and transparent, and they measure 0·96 to 0·98 inch in length by 0·7 in breadth.

The figures in the Plate accompanying this article represent the hill olive-coloured form and the low-country rust-coloured one. The former is from the Horton Plains, and the latter from the Kuruwite hills in Saffragam.

Genus DUMETIA.

Bill high at the base, compressed, the culmen curved gradually to the tip. Nostrils oblong; a few loral bristles present. Wings short, rounded; the 5th and 6th quills subequal and longest. Tail broad, cuneate at the tip. Tarsus rather short; toes slender, the lateral ones subequal.

Of small size.

DUMETIA ALBOGULARIS.

(THE WHITE-THROATED WREN-BABBLER.)

Malacocercus albogularis, Blyth, J. A. S. B. 1847, xvi. p. 453.

Dumetia albogularis, Blyth, Cat. B. Mus. A. S. B. p. 140 (1849); Layard & Kelaart, Prodromus, Cat. App. p. 58 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 272; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 403 (1854); Jerdon, B. of Ind. ii. p. 26 (1863); Holdsworth, P. Z. S. 1872, p. 447; Hume, Nest and Eggs, ii. p. 247 (1874); Butler, Str. Feath. 1875, p. 471; Bourdillon, ibid. 1876, p. 399.

Timalia hyperythra, Jerdon, Cat. B. S. India, Madr. Journ. 1839, x. p. 261.

Pellorneum albogulare, Blyth, J. A. S. B. 1852, xxi. p. 357.

"*Pig-bird*," in India; *Batitchia*, Sinhalese.

Adult male and female. Length 5·6 to 5·7 inches; wing 2·1 to 2·25; tail 2·2; tarsus 0·8; middle toe and claw 0·65; bill to gape 0·65.

Iris greenish white or white; bill, upper mandible dusky or pinkish brown with fleshy margin, lower mandible fleshy, tip dusky; legs and feet reddish fleshy, toes slightly dusky, claws brownish.

Above olivaceous brown, the forehead and front of crown rufous, and the hind neck slightly fulvescent or paler than the back; wings and tail brown, the primaries and rectrices slightly edged pale; upper tail-coverts in some covered with a yellowish hue; lores and orbital feathers whitish; beneath rufous, with the chin, upper part of throat, and centre of breast white; under tail-coverts and wing-coverts paler than the flanks.

The rufous of the lower surface seems to be brighter in the breeding-season, with the white of the throat and breast more sharply defined against it.

Young. Iris pale olive-greyish. The forehead wants the ferruginous tint, and is concolorous with the head.

Obs. Several examples in the British Museum are somewhat darker in the tint of the upper surface than most Ceylonese specimens that have come under my notice; the rufous colour of the forehead is slightly darker in my insular series than in the aforementioned, but the coloration of the under surface is similar. They measure in the wing from 2·05 to 2·2 inches. Mr. Bourdillon records the dimensions of a South-Indian specimen, measured in the flesh, as—length 5·62 inches; expanse 6·25; wing 2·12; tail 2·25; tarsus 0·73; bill from gape 0·57.

Distribution.—This interesting little bird is tolerably common in Ceylon, being found in nearly all parts of the low country and on most of the open, bushy patnas of the hill-region up to an elevation of 5600 feet or thereabouts. It is of frequent occurrence in the Western Province, being very partial to the damp sedgy parts of the cinnamon-gardens of Colombo; in the extreme south it is, perhaps, rarer, but in the south-east flat region between Haputale and the sea, and in many parts of the eastern portion of the island, it is a common bird. In the northern parts, again, it is not so frequent. In the great patna-districts of Uva, in similar localities in Hewahette, Dumbara, and on the slopes of the Knuckles, as well as in other open waste portions of the Kandyan Province, it is as plentiful as in most parts of the low country, and especially so in the patna-basin of Uva, being found there along the Badulla and Nuwara-Elliya road up to the vicinity of Hakgala. In the southern ranges it is likewise not unfrequent.

Jerdon has the following short paragraph on the distribution of this little bird in India:—"It is found throughout Southern India in suitable localities, in bushy jungle, ravines, thick hedge-rows, &c., but is entirely absent in the forest-districts of Malabar." Mr. Bourdillon writes of it as common in the Travancore hills from 1000 to 2000 feet elevation. Dr. Fairbank records it from Khandala and Mahabaleshwar, but not from Ahmednagar. The only other mention which I can find of it being found to the north of the Deccan is that by Captain Butler, who says it is not uncommon at Mount Aboo, and is occasionally seen in the plains of that district; Mr. Hume adds that this is by far the most northerly point reached by the species.

Habits.—The little "Pig-bird" (as it is not very aptly called by some of the natives in India) frequents bushy patnas, low scrub, grass-fields dotted with shrubs, detached woods, and waste land in the vicinity of jungle, associating in little troops, and keeping mostly out of sight in the lower parts of bushes and thick underwood; from such haunts it seldom strays, except when alarmed or when roaming hither and thither in the mornings and evenings, when little companies may be seen making their way from one piece of cover to another, in quite "follow-my-leader" fashion, each bird following its companion with a straight low flight and a weak, plaintive *wheet* note. When hunted out from a shrub or clump of brambles it endeavours to remain as long as possible under cover, hopping timidly from branch to branch, and cautiously peering out at its enemy, until it is time to beat a retreat, when it betakes itself off in the above methodical manner. Its food consists of the larvæ of various insects and minute Coleoptera, and in feeding it possesses much the manner of *Alcippe*. On one occasion I observed a little flock, which was assembled at the base of an umbrageous tree in thick jungle, indulging in a series of quaint antics; they were hopping spasmodically about, jerking up their wings with a puffing out of their breast-feathers, and every now and then dropping like balls of fluff on to a bed of dry leaves, where they seemed to have discovered a welcome supply of food.

Nidification.—The breeding-season lasts from March until July, the nest being built in a low bush sometimes only a few inches from the ground. It is globular in shape and loosely constructed of grass, stalks, and dry blades or bents, sometimes interwoven with fibrous or caterpillar-eaten leaves, the interior being composed of the same but finer material than the body. The eggs are usually three in number, dull white, closely freckled throughout with small ferruginous spots; in some there is a well-formed zone round the obtuse end. They are rather small for the bird, measuring 0·7 to 0·72 inch in length by 0·51 to 0·53 inch in breadth.

In South India this bird breeds in June. Mr. Hume thus describes a nest sent him by Miss Cockburn, and taken from a coffee-bush in the Kotagherry district. It was "small and nearly globular, composed entirely of broad flaggy grass, without any lining or any admixture whatsoever of other material; it was loosely put together, and had a comparatively narrow entrance at the top." This nest contained three eggs; and mention is made of another one with the same number. The ground-colour of these eggs was china-white, marked with a profusion of specks and spots, which, though spread over the whole surface, were "gathered most intensely into an imperfect, more or less confluent, cap or zone at the larger end, where, also, a few purplish-grey spots and specks, not found on any other part of the egg, were noticeable." They vary from 0·7 to 0·75 inch in length by 0·5 to 0·53 inch in breadth.

Genus ALCIPPE.

Bill stout; culmen curved from the base, commissure curved throughout; tip distinctly notched. Nostrils oval; rictal bristles small but stout. Wings rounded; the 5th quill generally the longest. Tail short and rounded. Tarsus longer than the middle toe and claw.

Of small size.

ALCIPPE NIGRIFRONS.

(THE CEYLON WREN-BABBLER.)

(Peculiar to Ceylon.)

Alcippe nigrifrons, Blyth, J. A. S. B. 1849, xviii. p. 815; id. Cat. B. Mus. A. S. B. p. 340 (1849); Kelaart, Prodromus, Cat. p. 122 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 269; Blyth, Ibis, 1867, p. 302; Legge, J. A. S. (Ceylon Branch) p. 42 (1870–71); Holdsworth, P. Z. S. 1872, p. 446; Legge, Ibis, 1874, p. 18; id. Str. Feath. 1875, p. 367.

The Mountain-Thrush, Kelaart; "*Quaker-Thrush*," popularly in India.

Batitchia, Sinhalese.

Similis *A. atricipiti*, sed minor, et fronte tantum nigrâ distinguenda.

Adult male and female. Length 4·9 to 5·3 inches; wing 2·15 to 2·3; tail 1·7 to 1·9; tarsus 0·8 to 0·9; mid toe and claw 0·7 to 0·75; bill to gape 0·65 to 0·7.

Females are the smaller of the sexes.

Iris yellowish white or very pale yellow; bill, gape, and culmen dark brown, margins of the upper and lower mandible fleshy; legs and feet fleshy lavender, claws dusky.

Forehead, face, and ear-coverts dull black, blending into the rusty brown of the occiput, upper surface, wings, and tail; outer primaries pale-edged; tail nigrescent towards the extremity and distinctly cross-rayed; beneath, the throat, neck, breast, and abdomen sullied white, with a dusky shade on the sides of the chest; flanks and under tail-coverts olivaceous rufescent; under wing-coverts and inner edges of quills beneath fulvescent buff.

The amount of black on the head varies, being continued further back in some specimens than in others.

Obs. There is a marked difference in the tint of the upper surface of this species according to the locality it inhabits. Examples from the south of the island and from the Western Province are, as described above, rusty brown, while those from the colder climate of the upper hills are decidedly olivaceous on the back and wing-coverts; specimens from the north of Ceylon are, as a rule, intermediate between the two. Although individuals vary *inter se* in the amount of ferruginous tint present on the back, the up-country race will be found, as a whole, to be decidedly less rust-coloured than the low-country birds. The same character, as already observed, is exemplified in the Scimitar-Babbler, *Pomatorhinus melanurus*.

Young. The nestling has the iris olive, but in plumage almost entirely resembles the adult, the forehead only differing in being less nigrescent.

Obs. The Ceylonese species is allied to the South-Indian *A. atriceps*, Jerdon, to which another closely affined race has lately been discovered by Mr. Bourdillon and described by Mr. Hume under the name of *A. bourdilloni*. *A. atriceps* has the head, face, and nape black, in addition to the forehead; the wings and tail are brownish olive (resembling in this particular our up-country birds, but paler even than they are), and the species is somewhat larger than ours. Specimens in the national collection measure 2·3 inches in the wing. *A. bourdilloni* has the black cap replaced by a brown one, and has the bill and tarsi stouter than in the last mentioned; the wing measures 2·4 inches. The Nilghiri Quaker-Thrush (*A. poiocephala*) is larger than any of the foregoing; wing 2·7 inches: it has the same style of coloration, but with the "head and nape dusky cinereous; back and rump greenish olive."

Distribution.—This little Wren-Babbler, which is the smallest of the Babbling Thrushes found in Ceylon, was discovered by Layard in 1848, and described, *loc. cit.*, by Blyth. It is one of the commonest and most widely distributed of our jungle-birds, being found throughout the whole island up to the jungle-clad summits of the peaks of the main range. It is common throughout the Kandyan and southern hills wherever there

is either forest, low jungle, or even scrubby copse; and the same is true of the low country, where even small detached woods, containing any underwood at all, are tenanted by it. In some portions of the sea-board which are clothed with dry, arid scrub, such as on the south-east and north coasts, it is rare; but even in these it is met with in spots sheltered by tall trees from the blazing heat of a tropical sun. It is especially numerous in those portions of the Western and Southern Provinces in which the forests and jungle contain bamboo undergrowth.

Habits.—This modest but active little bird frequents underwood, thickets, and tangled jungle in little parties of from six to a dozen in number, feeding among fallen leaves which have become lodged among bushes, or about prostrate trunks of trees, and on the ground itself, subsisting entirely on various insects and their larvæ. It keeps up a constant little rattle-note as it threads its way about in the dense undergrowth, dropping, perhaps, suddenly from a branch on to some large Bairoo-leaf (*Sarcoclinium longifolium*) with a startling noise, or flitting through matted bamboos across the closely begirt jungle-paths, each little member of the troop following its mate in true Babbler fashion. It is most active in its movements; I have rarely seen it in a state of quiescence, except when, in the heat of the day, I have chanced to espy a little row seated in close proximity on some horizontal twig or bamboo-stalk, silently feathering themselves after their morning's exertions in search of food. They display much inquisitiveness, flitting round any one who may be standing still in thick jungle, jumping to and fro about the twigs and dead leaves, and stretching out their heads while they utter their shrill little rattle.

Nidification.—The breeding-season in the north of the island lasts from November until March, and in the south, where most of our birds nest during the rains, from March until August. Mr. Parker writes me that in the Seven Korales they breed mostly in May. The nest, as stated in my note, 'Stray Feathers,' 1875, p. 368, "is generally placed in a bramble or straggling piece of undergrowth, often in a prominent position near a jungle-path, at a height of from 2 to 4 feet from the ground." It is almost invariably made of dry leaves placed horizontally or in layers one on the other, the top being supported by the intermixture of a few twigs, and the opening being a wide unfinished orifice almost on a level with the bottom of the interior, which is composed of the same material as the outside. The structure thus formed is a shapeless, globular mass, sometimes of one foot in diameter at least, and from its large size and generally exposed situation is one of the first nests which meets the eye in the Ceylon jungles.

The birds construct these nests with great rapidity, picking up the leaves one after the other from just beneath the spot in which they are building. As mentioned in my notes in the 'Ibis,' 1874, I have seen them, from a place of concealment, sticking the leaves into the structure at the rate of two or three a minute. From the number of these leaf-nests that one finds in the forests of Ceylon it would appear that probably several are constructed by the same birds before the eggs are deposited in the one finally chosen by the little architects. They are used as a roosting-place by the young brood, who resort to them at nights after they have reached their full size and are abroad with their parents. The eggs are invariably two in number, stumpy ovals in shape, and of smooth texture. The ground-colour, before they are blown, is a clear fleshy white, spotted openly all over, or in some chiefly at the large end, with rounded spots of dull red and brownish red underlaid by a few specks of bluish grey. They measure 0·74 to 0·75 inch by 0·55 to 0·56 inch.

In the Plate accompanying the next article will be found two examples of this species—the one from Nuwara Elliya, showing the olivaceous character of the hill-birds, the other from the low country, exhibiting the same rusty-coloured tints which characterize the lowland form of *Pomatorhinus*.

ALCIPPE NIGRIFRONS.
PELLORNEUM FUSCICAPILLUM.

Genus PELLORNEUM.

Bill longer than in the last, straighter; the nostrils more linear; rictal bristles feeble. Wings rounded; the 5th, 6th, and 7th quills nearly equal and longest. Tail not shorter than the wing, rounded at the tip and graduated. Tarsus lengthened, its scales obsolete; toes stout, the lateral ones subequal.

PELLORNEUM FUSCICAPILLUM.

(THE WHISTLING QUAKER-THRUSH.)

(Peculiar to Ceylon.)

Drymocataphus fuscocapillus, Blyth, J. A. S. B. 1849, xviii. p. 815; id. Cat. B. Mus. A. S. B. p. 340 (1849); Kelaart, Prodromus, Cat. p. 122 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 269.

Pellorneum fuscocapillum, Blyth, Ibis, 1867, p. 301.

Drymocataphus fuscicapillus, Holdsw. P. Z. S. 1872, p. 447; Legge, Ibis, 1874, p. 19, et 1875, pp. 393, 410.

Batitchia, Sinhalese.

♂. Suprà brunneus, supracaudalibus paullò rufescentibus: alis brunneis, tectricibus et remigibus angustissimè rufescenti marginatis: rectricibus brunneis, extimis rufescenti terminatis: pileo nigricanti-brunneo, fronte vix rufescente lavatâ, scapis plumarum omnium rufescentibus: loris, supercilio distincto, facie laterali et colli lateribus, et corpore subtùs toto cervinis, abdomine pallidiore fulvescente, hypochondriis brunneo lavatis: subalaribus pectori concoloribus: remigibus infrà brunneis, intùs rufescenti lavatis: rostro saturatè brunneo, mandibulâ carneâ: pedibus rufescenti-carneis: iride rufescenti-brunneâ.

Adult male and female. Length 6·4 to 6·8 inches; wing 2·5 to 2·8; tail 2·4 to 2·6; tarsus 1·0 to 1·1; mid toe 0·7 to 0·75; claw (straight) 0·3; bill to gape 0·8 to 0·85.

Iris varying from light reddish to dark red; eyelid olivaceous; bill, upper mandible deep brown with a pale margin, lower flesh-colour; legs and feet brownish fleshy, toes darker than tarsi, claws pale brownish.

There are two races of this little bird in Ceylon—a dark and a pale, the latter inhabiting the north of the island only, the former being found in the south-west and central portions of the island.

Dark race. Forehead, crown, nape, and upper part of hind neck dark glossy sepia, almost black, the feathers with fulvous shafts; lower part of hind neck, back, wings, and tail brownish olivaceous, with pale shafts to the feathers of the back; wing-coverts edged fulvous; outer primaries with pale edges; tail tipped with fulvous, most deeply on the lateral feathers; lores, supercilium, face and throat, and all beneath light sienna-brown, palest on the chin and abdomen, and with flanks dusky: the cheeks, ear-coverts, and sides of neck of a deeper or more rufous hue than the throat.

Birds from the Southern and Central Province districts, which constitute the dark race, vary very much in depth of colouring. Some have the head very dark and the feathers of the back dark-edged, the entire plumage being at the same time of a deeper hue; in such examples the feathers at the sides of the chest are centred with brown.

Pale race (from the whole of the northern and north-eastern parts of the island). The head and nape are light sepia-brown, with the edges of the feathers distinctly darker; the upper surface, wings, and tail pale olivaceous, with a greyish hue, and the shafts of the clothing-feathers very light; the wing-coverts and rectrices more conspicuously tipped, and the under surface very pale throughout.

Young. Birds of the year have the iris browner than adults, and the rump paler than the back: the drop-marks on the sides of the chest are likewise more distinct, and the tail but faintly tipped fulvous.

Obs. This bird was placed by Blyth in the genus *Drymocataphus*, which was instituted for a Malaccan species, *D. nigrocapitata*, differing slightly in the proportion of its longer quill-feathers, and having a slightly different type of plumage from *Pellorneum*. I have compared our bird with *Pellorneum ruficeps* of Southern India, and the quills are the same, and also the bill. The proportion of the *longer* quills in any given species appears, in many cases, to be an unsafe character, and certainly not worthy of consideration in the creation of genera, unless it be thought desirable to burden ornithology with a still greater multiplicity of genera than it is at present hampered with! In the present case, for instance, the 7th quill is subject to variation in individuals, some having it equal to the 6th and some shorter. In the type species of *Drymocataphus* the tail is shorter than the wing by about the length of the bill, and in this it therefore differs from our bird and from typical *Pellorneum*: the wing is, however, much the same in both forms; and I scarcely think that the genus *Drymocataphus* is a good one, unless the character of the head-plumage, as exemplified in the several species forming this little group, be allowed consideration enough to justify its establishment. The present species was subsequently classed by Blyth as a *Pellorneum*, and Mr. Holdsworth again restored it to its position as a *Drymocataphus*.

Distribution.—This little bird, one of the most interesting species peculiar to the island of Ceylon, was discovered by Layard. He writes:—" But two specimens fell under my notice. One I killed with a blow-pipe in my garden in Colombo, the other I shot in the Central Road." Mr. Holdsworth procured but one specimen, shot in the north of the island, and, in common with Layard, conceived it to be a rare species, its very shy and retiring nature, and its habit of only frequenting thick underwood, obviously giving rise to this idea. On the contrary, however, it is a common and widely distributed bird, being found as a resident more or less over the whole low country, with perhaps the exception of the Jaffna peninsula and some of the open coast districts in the north-west. It is most numerous in regions covered with large tracts of jungle, occurring in such places everywhere, and least so in cultivated portions of country, in which it is confined to wooded knolls or overgrown waste land. It is, accordingly, scattered through all the jungle-clad low hills of the Galle district, the flat forests of the south-east, and the wilds of the Eastern Province, as well as through the entire forest-region of the north, across from Trincomalie (where it is numerous) to the confines of the open country on the north-west, and thence down to the Chilaw and Kurunegala districts. In the Western Province its distribution is partial, it being there most numerous in the jungles of the interior, of Saffragam, and in the region lying at the base of the mountains. In these latter it is found, as also in the southern ranges, ascending in the Kandyan Province to an altitude of about 5500 feet. In the district of Uva and in most of the deep wood-dotted valleys below the coffee-estates it is common, frequenting likewise the intermediate belts of forest above them in Haputale and the main range.

I would here remark that there is no bird in Ceylon concerning the distribution of which my predecessors in ornithological work appear to have been so misled. Scarcely any species shows itself less, but, on the other hand, none make more noise from their place of concealment. An acquaintance with its note, therefore, was required, and failing this one could not but pass it by completely. For my own part I imagined it, during the first three years of my labours in Ceylon, to be one of the rarest of birds, for I could never meet with it in the Western Province. Shortly after I went to Galle, while collecting one morning in the vicinity of the Bonavista Orphanage (to the hospitable and kind superintendent of which I am indebted for the passing of many a pleasant hour in one of the most charming little bungalows in the low country), I was attracted by a bird-note which I remembered often to have heard, and on procuring its owner was surprised to find that I had at last obtained this much-looked-for species. In the same manner I captured it very soon afterwards near Wackwella, and then in other copses in the neighbourhood, and soon ceased to pay any attention to its whistle. On going to Trincomalie my first day's trip into the jungle renewed my acquaintance with my little friend, and so on wherever I travelled I continued to hear the garrulous bird, until it had to be noted in my catalogue as a common and widely distributed species, and as such was spoken of in my account of the birds of the south-west hill-region ('Ibis,' 1874). To this Mr. Holdsworth, who had not made the acquaintance of its note, somewhat naturally took exception in his comment on my paper published in the following number of the 'Ibis.' Mr. Bligh, however, knows it to be a common bird in the Haputale jungles; and those who hereafter work in the ornithological field of Ceylon will, I doubt not, substantiate my experience.

Habits.—This Babbler, as has just been remarked, is a very shy and retiring bird, and a denizen, for the

most part, of forests and cheena-woods, but likewise frequents scrub, brushwood, low jungle, or overgrown land in the vicinity of native cottages. It dwells entirely in the seclusion of such vegetation, feeding near the ground in dense thickets or picking up beetles and insects from amongst decaying herbage; it rarely shows itself in the open except to flit across a jungle-road or forest-path. It is usually found in pairs, except after breeding, when it combines with its newly-reared family to form a little troop, which comport themselves much as *Alcippe*. Its note, which is one of the characteristic sounds of the Ceylon jungles, is a persistently repeated whistle, resembling the words "*to-meet-you.*" This is varied, on the part of the male in the breeding-season, by a combination of ascending and descending bars, which form a pleasant little warble. In the short note there is a peculiar intonation which partakes of the power of ventriloquy, and which renders, at times, the determining of the bird's position a difficult matter. The Whistling Babbler is especially noisy in wet weather, and during the breeding-season utters a low purr when the vicinity of its nest is approached. At this period I have observed a pair seated on a low branch, bowing and courtesying to each other, with their tails carried erect, and appearing to be most intent on rendering themselves mutually attractive. The stomach in this species is muscular; and I have found large beetles therein, proving its digestive powers to be considerable.

Nidification.—The nest of this species is exceedingly difficult to find, and scarcely any thing is known of its nidification. Mr. Bligh succeeded in finding it in Haputale at an elevation of about 5500 feet. It was placed in a bramble about 3 feet from the ground, and was cup-shaped, loosely constructed of moss and leaves; it contained three young. I found what I have reason to believe was a nest of this species at Agalewatta, which was constructed chiefly of the dead leaves of a recently felled shrub, in which it was placed about 2 feet from the ground; it was large and loosely made, resembling the nest of *Alcippe*, but lined with fine dry roots. Although it contained no eggs, I observed the birds frequenting it, and have no doubt, therefore, as to its ownership. Mr. Bligh writes me concerning a brood of four or five young which he found in the Central Province; they had just left the nest and were frequenting some thick brambles, in which he caught several of them with ease. The parent birds, he remarks, "seemed as if they would have died of distress, trying to draw me away by tumbling and fluttering about on the ground as if badly wounded, and nearly buffeting me when I had the young in my hand."

The figure in the Plate accompanying this article is that of a dark-coloured Western-Province specimen, which was shot in the Three Korales.

Genus PYCTORHIS.

Bill short, curved, high at the base, tip entire. Nostrils rounded; rictal bristles strong; orbits nude. Wings rounded, the 5th to the 7th quills subequal and longest. Tail long and graduated. Legs and feet stout. The tarsus shielded with broad smooth scutæ, anterior toes moderately short; hind toe and claw lengthened.

PYCTORHIS NASALIS.

(THE BLACK-BILLED BABBLER.)

(Peculiar to Ceylon.)

Chrysomma sinensis, Blyth, Cat. B. Mus. A. S. B. p. 150. no. 860, spec. *c* (1849); Kelaart & Layard, Prodromus, App. p. 58 (1853); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 272.

Pyctorhis sinensis, Jerdon, B. of Ind. ii. p. 15 (1863, in pt.); Holdsw. P. Z. S. 1872, p. 448; Legge, Ibis, 1875, p. 290.

Pyctorhis nasalis, Legge, Ann. & Mag. Nat. Hist. 1879, iii. p. 169.

Batitchia, Sinhalese.

Similis *P. sinensi*, sed saturatior, et remigibus haud rufo marginatis, supercilio albo longiore et naribus nigris nec flavis distinguenda.

Adult male and female. Length 6·2 to 7·0 inches, average about 6·5; wing 2·5 to 2·85; tail variable, extreme length about 3·5, centre feathers 1·25 longer than the outermost; tarsus 0·95 to 1·1; middle toe with its claw 0·85; bill to gape 0·65 to 0·7. The average length of wing is 2·6; the limit above given relates to an exceptionally large specimen shot in Uva.

Iris golden yellow; eyelid chrome-yellow; loral skin, which is perceptible through the feathers, greenish yellow; bill and nostril black; legs and feet dull yellow, extremities of toes dusky; claws dusky horn-colour.

Above ruddy earth-brown, the head darker than the hind neck; wings brown, the primaries at the base only edged outwardly with ruddy brown, elsewhere with greyish; wing-coverts concolorous with the bases of the primaries; tail greyish brown, the feathers edged pale; lores, a conspicuous supercilium, throat, and under surface white; the flanks, lower parts, and under tail-coverts tinged with buff; under wing-coverts buff-white.

Some examples, probably immature birds, are more deeply tinged on the lower parts than others, and some have a brownish spot immediately below the gape.

Obs. A comparison of a series of *Pyctorhis sinensis* from various parts of continental India, with a number of Ceylonese specimens of the species, which has hitherto been united with it, induced me to separate the latter as a subspecies or local race, differing in the absence of both the yellow nostril and the reddish wing-coloration from its Indian congener. Examples from Kamptee, Kattiawar, Behar, Nepal, N.W. Himalayas, and the North-west Provinces have a smaller eye-stripe and the upper surface of a ruddier hue than our bird; the head, in particular, displays this character; some specimens (Futteghur and Kattiawar) are more sandy than others, and have the rump and tail-feathers markedly pale. A Bhotan-Doars example, however, differs from all others I have seen in being very dark on the head and back; in all, the outer webs of the quills, except near the tips, are dull cinnamon-red, and the coverts are chestnut-brown, that is, not quite so red as the quills. The nostril membrane is deep yellow, while that of the Ceylonese race is as black as the bill; and this singular character forms, perhaps, the chief distinction between the birds of the two localities. As regards size, the Indian bird appears to measure somewhat less in the wing (2·35 to 2·6) and more in the tail (3·3 to 3·7 inches).

I have not had the opportunity of extending my examination to specimens from the south of India; and, in so far as I have not done this, I still consider my determination of the Ceylonese species as peculiar to the island open to correction. It may be that the race inhabiting the extreme south resembles the Ceylonese in coloration more closely than does that from *continental India*; but I have not yet seen any peculiarity in the colour of the nostril spoken of by recent observers. Blyth, in the first mention of the Ceylonese race which he received from Layard, says, "less rufous variety from Ceylon;" but in this he compares it with specimens from Lower Bengal.

Distribution.—The Black-billed Babbler is widely distributed throughout the island, particularly as regards the southern half; but at the same time it is a local bird, being altogether absent from some parts, while it is tolerably common in others. Commencing with the Western Province, it is not uncommon in the sedgy

overgrown portions of the Colombo cinnamon-gardens, and occurs in such-like situations throughout the more open parts of the interior; further south I have found it at Amblangoda and near Galle and Matara; but it does not become common until the dry low-lying south-eastern country is reached, of nearly all parts of which it is an inhabitant. The open elevated regions of Madulsima and Uva are, perhaps, its head-quarters, in all the patnas of which it is a very common bird, extending up to the vicinity of Hakgala, which has an elevation of 5800 feet. In the eastern portions of Dumbara, and in the country lying between Bintenne and Batticaloa, it is also found, occurring likewise in low cheena-copses throughout the north-east, or the country on the right bank of the Mahawelliganga. Layard writes that he obtained a few specimens in the Anaradhapura Vanni, and I have no doubt that it is found in places as far north as Elephant Pass.

Habits.—Swampy fern-brakes, grass-fields interspersed with bushes, low jungle in cheenas, and patnas covered with maana-grass, lantana, and thick cover are the localities chiefly frequented by the present species. It is a shy bird, except in the breeding-season, resorting to underwood or long grass during most of the day, and not showing itself to any extent until evening, when it perches on the top of a bush, and gives out its loud far-sounding, rather plaintive whistle of two notes, varied with a peculiar mewing call. It is generally found in pairs, in which habit it differs from most of its family, and when disturbed from its haunts flies quickly out, and, settling for a moment on a tall grass-stalk or prominent stick, drops into the nearest bush at hand. A little group of three or four are, however, sometimes seen together; but, in general, I imagine that they consist of a young brood with their parents. It proceeds swiftly through the thickest grass, and when wounded or winged runs with great speed on the ground, and inevitably escapes into the tangled undergrowth. In the breeding-season it is a lively bird, with all the manners of a Warbler, flying hither and thither, the male continually alighting on some prominent position and uttering a strong and rather pretty warble. I have always found its food to consist of small Coleoptera and various minute insects. The district of Uva is the only locality where I have seen small parties of this bird, and then not more than three or four together, which were probably, as previously remarked, a young brood accompanied by their parents.

Jerdon writes of its Indian ally, "It frequents low jungles on the skirts of forests, long grass, hedge-rows, and even comes occasionally into gardens. Though sometimes to be met with singly, it is generally seen in small parties of five or six, flying from bush to bush before you, and trying to conceal itself in some thick clump. It has a low chattering note when at rest, and when flying from bush to bush a loud sibilant whistle. I have on several occasions heard one, perched conspicuously on a high bush, pour forth a remarkably sweet song." In this latter habit the Indian species exactly resembles ours.

Nidification.—In the Western Province this Babbler commences to breed in February; but in May I found several nests in the Uva district near Fort Macdonald; and that month would thus seem to be the nesting-season in the Central Province. The nest is placed in the fork of a shrub, or in a huge tuft of maana-grass, without any attempt at concealment, about 3 or 4 feet from the ground. It is a neatly-made compact cup, well finished off about the top and exterior, and constructed of dry grass, adorned with cobwebs or lichens, and lined with fine grass or roots. The exterior is about $2\frac{1}{2}$ inches in diameter by about 2 in depth. The eggs are usually three in number, fleshy white, boldly spotted, chiefly about the larger end, with brownish sienna; in some these markings are inclined to become confluent, and are at times overlaid with dark spots of brick-red. They are rather broad ovals, measuring, on the average, from 0·76 to 0·79 inch in length by 0·56 to 0·59 in breadth.

The figure of this species in the Plate accompanying the next article is that of a female shot in the Madulsima district.

Genus ELAPHRORNIS*.

Bill straight, compressed, rather slender; culmen straight at the base, the tip notched. Nostrils oblong and oblique; rictal bristles feeble. Wings short and rounded, the 5th, 6th, and 7th quills subequal and longest, the 1st about half their length. Tail exceeding the wing by the length of the hind toe, of 12 feathers, lax and graduated. Tarsus longer than the middle toe and its claw, and covered with long obsolete scales; anterior toes slender, the hallux stout.

Plumage lax and soft; the feathers of the back much lengthened. Nape furnished with abnormal hair-like feathers.

ELAPHRORNIS PALLISERI.

(PALLISER'S ANT-THRUSH.)

(Peculiar to Ceylon.)

Brachypteryx palliseri, Blyth, J. A. S. B. 1852, xx. p. 178; Kelaart, Prodromus, Cat. p. 102 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 269; Holdsworth, P. Z. S. 1872, p. 443, pl. xviii.

Kelaartia palliseri, Gray, Hand-l. B. i. p. 312. no. 4668 (1869).

♂ ad. suprà brunneus, pileo saturatiore et magis olivascente: tectricibus alarum brunneis dorsi colore lavatis: remigibus brunneis, extùs olivascentibus: caudâ saturatè brunneâ, rectricibus clariore brunneo lavatis: loris cinerascenti-albis: lineâ superciliari cinerascente indistinctâ: regione paroticâ et plumis infraocularibus brunneis, angustè albido lineatis: gulâ pallidè cervino-rufâ: pectore olivascente flavo lavato, lateraliter cineraceo adumbrato: corporis lateribus, tibiis et subcaudalibus brunneis: abdomine medio pallidè flavo: subalaribus olivascenti-brunneis: remigibus infrà brunneis, intùs pallidè marginatis: rostro nigro, mandibulâ pallidiore: pedibus purpurascenti-brunneis: iride ♂ pallide rubrâ, ♀ flavescenti-cervinâ.

Adult male and female. Length 6·4 to 6·75 inches; wing 2·35 to 2·65; tail 2·5 to 2·7; tarsus 1·0 to 1·1; middle toe and claw 0·8 to 0·85; bill to gape 0·73 to 0·87. The female is the smaller of the sexes.

Male. Iris clear red; bill black, slate at the base beneath; legs and feet deep neutral brown or purplish brown, claws pale brownish horn.

Female. Iris buff.

Above olive-brown, darkest on the forehead, and changing to rusty brown on the rump, upper tail-coverts, and tail, the centre of the tail-feathers darker than the margins; wings dark brown, the outer webs of the quills rusty olive-brown; lores just beneath the eye, as also the ear-coverts, blackish brown, the latter with pale striæ; a faint light stripe passing from the bill over the eye; orbits greyish; chin whitish, changing into buff-yellow on the gorge and upper part of throat, which blends into the olivaceous slate-colour of the chest and sides of breast; lower flanks and under tail-coverts rusty brown; centre of the breast and the belly flavescent, blending into the surrounding colour.

Young. Iris, in the male pale reddish buff; in the female white.

Obs. A question to be decided by future obesrvation is whether the iris of the female ever turns red. I have one specimen with a faint inner reddish circle; but I have never shot one with a red iris like that of the male, the

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* From ἐλαφρὸς, nimble, active.

PYCTORHIS NASALIS.
ELAPHRORNIS PALLISER.

invariable colour being buff. As the iris in the male turns from buff to red, and that of the female from white to buff, the inference is that, in the end, the latter may possibly become as dark as that of the male.

Chin dusky greyish, the centres of the feathers whitish, and a slight wash of buff across the centre of the throat; breast and underparts more greenish than in the adult, the chest being devoid of the slaty hue.

Obs. This curious bird is quite a *Timaline* species, both as regards its habits and its external structure. Its wings and legs are essentially those of the present family, and the texture of its plumage is not unlike that of *Pomatorhinus*, although it is considerably more lax. It has, however, its abnormal characteristics, such as its slender bill and its highly developed nuchal hair-like plumes, which ally it to the Drymœcinæ. These plumes possess the remarkable structure of dividing at the tip into three or four branches, each of which is furnished with a scanty web; it likewise differs from most of the Timaliinæ in its non-gregarious propensity, resembling also, in this respect, the Drymœcinæ. Notwithstanding, it seems to me to take a better station among the Babblers, to which its active habits, wing- and tail-structure ally it, than among the Wren-Warblers; and I accordingly place it at the end of the Timaliinæ.

It was placed by Blyth in the genus *Brachypteryx*, which is located by Jerdon and others among the Thrushes in the subfamily Myiotherinæ. With the exception of the short wing, it does not appear to have any thing in common with this genus, one of the principal characters of which is the very short tail, *much exceeded by the wing* in all the species I have examined. In some, such as *Brachypteryx poliogenys*, Wallace, the tail falls short of the wing by *the length of the tarsus*, whereas in the present bird the tail considerably exceeds the wing, and the gape is bristled and not smooth. I have accordingly founded for its reception the genus *Elaphrornis*, which title I conceive to be not inappropriate, owing to its active manners.

Distribution.—This singular and little-known bird was discovered by Kelaart, who suggested its present specific name in honour of a friend, Mr. Palliser of Dimbulla; he procured it at Nuwara Eliya and Dimbulla. But few naturalists have met with it, owing to its propensity for inhabiting dense thickets in thick jungle. It is confined to the upper hills and higher ranges in the outlying districts, in all of which it is found above an elevation of about 5000 feet. It is a common bird in all the forests of the main range, from False Pedro to the Horton Plains, and thence along the Peak forest to Maskeliya. It is found on Namooni-kuli mountain and on the Haputale hills. Mr. Bligh, however, writes me that for the past three years he has not met with it in the higher jungles of this district, in which it used formerly to be common during the autumn months. For my own part I do not believe much in its moving about; it may be more silent at one time than another, and consequently may chance to be overlooked, for it shows itself but little, except during the early morning, and an acquaintance with its singular note is requisite to a knowledge of its whereabouts. It is, perhaps, more numerous on the Horton Plains than any other part of the Nuwara-Elliya plateau; the woods there are overgrown with elephant-grass (*Arundinaria debilis*?), its favourite haunt, and in this it dwells securely. It must be looked for in the upper jungles of the Knuckles range: when I visited them I was unacquainted with its note, and consequently it found no place in my catalogue of the birds of that district; but the conditions of climate and vegetation are similar there to those of other parts.

Habits.—This Ant-Thrush dwells entirely in the damp close underwood with which the upper Ceylon forests are overgrown; it delights in the nilloo-scrub and the densely matted "elephant-grass," which I have just referred to, both of which form the chief part of the undergrowth in the Nuwara-Elliya district: equally favourite haunts, however, are the numberless little nullahs leading to the mountain-streams, and which are generally blocked up with fallen timber of all sizes, and a tangled mass of dead nilloo-sticks, thorns, decaying boughs, and such like; and here this little retiring bird passes a quiet though active existence, nimbly searching about the mossy trunks, quickly hopping and running along the ground beneath the tangled thickets, through which it threads its way with astonishing rapidity, or darting about the bases of standing trees in the pursuit of ants and other minute insects. It likewise partakes, to some extent, of small seeds, some of which I have occasionally found in its stomach. To the ordinary observer, therefore, it is likely, with such habits, always to remain a stranger; but those to whom its insect-like note, which sounds like the syllable "*quitze*," sharply uttered at moderate intervals, is familiar may frequently detect it in the vicinity of forest-paths, at the sides of which it often appears for a moment, quickly darting across and clinging to the upright trunk of a tree, while it utters a rapid little warble, and then darts into the surrounding vegetation.

As with other birds in Ceylon which are denizens of thick jungle, I find that scarcely any Europeans are

acquainted with the Ant-Thrush, although it is, in the limit of its range, quite a common bird, but at the same time of such retiring manners, and so difficult to hunt into the open, that its presence is overlooked by those who are unacquainted with its voice; while, on the contrary, those who are familiar with it will recognize its sharp little *quitze* at every 100 yards in such quiet solitudes as the jungles of the Horton Plains and other similarly elevated regions. It is chiefly astir in the early part of the day; and its lively little song is at that time oftenest heard. It feeds entirely on the ground and among fallen timber, its strong, curved, hind claw enabling it to cling to wood in any position, and its stout legs affording it the power of threading its way quickly through the densest brakes. It is of unsociable habit, shunning the companionship of any species but *Alcippe nigrifrons,* with which I have once or twice found it associating.

Mr. Holdsworth's experience of its habits corresponds well with my own. He writes, "Frequently it betrays its close neighbourhood by its '*cheep*' once or twice repeated; and it will show itself for a moment within two or three yards of one; then it is lost again in the thick jungle. . . . . When on the ground it often jerks up its tail after the manner of the Robins; but I have not observed this habit when it has been on the stems of the jungle plants or creeping about the dry sticks."

Nidification.—The Ant-Thrush breeds in March and April. Mr. Bligh writes me, "I found a nest at Nuwara Eliya in April 1870; it was placed in a thick cluster of branches on the top of a somewhat densely-foliaged small bush, which stood in a rather open space near the foot of a large tree; it was in shape a deep cup, composed of greenish moss, lined with fibrous roots and the hair-like appendages of the green moss which festoons the trees in such abundance at that elevation. It contained three young ones, plumaged exactly like their parents, who kept churring in the thick bushes close by, but would not show themselves much."

The figure in the Plate accompanying this article is that of a male shot at Horton Plains.

PASSERES.

TIMALIIDÆ.

Subfam. DRYMŒCINÆ.

Bill more or less straight, acute at the tip. Wings rounded, with the 1st quill about half the length of the longest. Tail as long as, or longer than, the wing, graduated, the feathers lax. Legs and feet stout; the tarsus lengthened and shielded with moderately developed scutes; hind toe and claw large.

Of small size. Nape mostly furnished with "hairs."

Genus ORTHOTOMUS.

Bill long and slender, straight, tip entire. Nostrils basal, lateral, and somewhat advanced; rictal bristles minute. Wings short and rounded; the 1st quill more than half the length of the 2nd; the 4th and 5th the longest. Tail very narrow, the centre feathers, in some, elongated at the breeding-season. Tarsus long, stout, and scutellate in front. Toes slender, claws much compressed.

Nuchal "hairs" moderate.

ORTHOTOMUS SUTORIUS.

(THE INDIAN TAILOR-BIRD.)

Orthotomus sutorius, G. R. Forster, Ind. Zool. p. 17 (1781).

Motacilla sutoria, Penn. Ind. Zool. p. 17, pl. 8 (1790).

Motacilla longicauda, Gm. Syst. Nat. i. p. 954 (1788).

Orthotomus longicauda (Gm.), Strickl. Ann. & Mag. Nat. Hist. 1844, xiii. p. 35; Blyth, Cat. B. Mus. A. S. B. p. 144 (1849); Kelaart, Prodromus, Cat. p. 120 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 262; Moore, P. Z. S. 1854, p. 81; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 317 (1854); Jerdon, B. of Ind. ii. p. 165 (1863); Holdsw. P. Z. S. 1872, p. 455; Hume, Nests and Eggs, ii. p. 331 (1874); Oates, Str. Feath. 1875, p. 135; Butler & Hume, *t. c.* p. 479.

Orthotomus sutorius (Forst.), Hodgs. in Gray's Zool. Misc. p. 82 (1844); Walden in Blyth B. Burm. p. 120 (1875); Fairbank, Str. Feath. 1877, p. 406; Davison & Hume, ibid. 1878, p. 345.

Le petit Figuier à longue queue de la Chine, Sonn. Voy. Ind. ii. p. 206; *Long-tailed Warbler*, Lath.; *The Rufous-headed Tailor-bird*, Kelaart. *Phutki*, Hind.; *Tuntuni*, Beng.; *Patia*, lit. "Leaf-bird," Nepal.; *Likku jitta*, Telugu.

Tavik, Sinhalese, from the note.

Adult male. Length 4·2 to 5·0 inches (according to length of tail in breeding-season), average normal length 4·3; wing 1·8 to 1·9; tail 2·0 to 2·5, centre feathers 0·75 to 0·8 longer than the rest; tarsus 0·75; middle toe and claw 0·55; bill to gape 0·65 to 0·7.

Adult female. Smaller than male; length 4·1 to 4·2 inches; wing 1·7.

Iris pale reddish; eyelid rufescent yellow; bill fleshy, with dusky culmen; legs and feet fleshy reddish or "flesh-colour."

Forehead and crown rufous, changing into ashy on the nape, and thence into the olive-greenish of the hind neck, back, scapulars, and lesser wing-coverts; quills and tail light brown, the latter tipped pale and with a subterminal bar of darker brown; tail-feathers towards their bases, and the wing-coverts and tertials, edged with the hue of the back; the primaries edged with olivaceous; throat, face, and under surface whitish, purest on the lower breast; the flanks and sides of chest ashy grey; a dark patch (usually concealed) on either side of the throat, formed by the bases of the neck-feathers and the blackish skin of that part; under wing-coverts rufescent yellow, and the thighs brownish rufous. The elongated centre tail-feathers are yellowish olive-green, and they are indistinctly tipped and banded like the rest. The nuchal hairs are small in this species.

Young. Birds of the year have the under mandible dusky and the legs brownish fleshy.

The forehead and crown are dusky rufous; the upper tail-coverts and margins of tail-feathers near the base are slightly rufous; otherwise as in the adult.

Obs. Jerdon has pointed out that in specimens from Ceylon "the ashy nape is inconspicuous, being nearly overlaid with rufous, and passing into the green of the back." A comparison of my specimens with various examples from different parts of India demonstrates that, as a rule, the latter are of a darker green on the back, and have the forehead a deeper rufous, this colour not receding so far back as in the island birds, and also that frequently the ashy nape extends more forward. Then, again, as a rule, in the Indian birds the central tail-feathers are longer, consequently projecting further beyond the adjacent pair. These differences, however, are by no means constant, some examples from various parts of India coinciding exactly with ours. A Malabar example in my collection is in all respects the same, having the ashy nape similar to Kurunegala specimens, and the forehead and upper surface of precisely the same tint; its measurements are:—wing 1·9 inch; tail 2·5, central feathers 0·65 longer than the next; bill to gape 0·65. A Deccan specimen has the tail 2·8 inches; but this is exceptional, for one from Darjiling measures 2·4 inches, central feathers 0·65 longer than the next, bill to gape 0·65: one from Behar, tail 2·4, central feathers 0·5 longer than the next; another from Tenasserim 2·5, central feathers 0·5 beyond the rest. In the latter the rufous of the forehead does not recede so far back as in some Ceylonese birds, but the nape is not more cinereous than in them. In the Darjiling specimen the nape is *slightly* darker than in most island birds, and in that from Behar it is considerably so.

O. edela, Temm., from Java, is allied to the present species, and differs in having the cheeks and ear-coverts rufous as well as the forehead, and the upper surface greyish green; wing 1·7 inch.

Distribution.—The Tailor-bird is ubiquitous in Ceylon, inhabiting the whole island, without regard to the nature of the locality, from the sea-coast to the highest parts of the upper hills. It is uniformly diffused through the low country, being quite as common in the north and east as it is in the south. In the Kandy district and throughout the Central Province it is a well-known bird, and about Nuwara Eliya it is not uncommon. I found it in the Horton-Plain jungles and on the surrounding mountains, and have met with it in all parts of the main range that I have explored.

In India this little bird is spread throughout the whole country to the Himalayas and thence into Burmah and Tenasserim, in which latter province Messrs. Hume and Davison say that it is generally distributed where the country is cultivated; they procured it as far south as Mergui. It ranges into the hills of the southern part of the peninsula, but not to so great an altitude as in Ceylon. Miss Cockburn, in writing from the Nilghiris to Mr. Hume, remarks that it is seldom met with on the highest ranges, but appears to prefer the warmer climates at about 3500 or 4000 feet. Mr. Fairbank, however, observed it at 5500 feet in the Palanis. In the Himalayas it breeds up to 4000 feet. In Guzerat and the Mount-Aboo district it is common, and in Sindh it has likewise been procured.

Habits.—This interesting little bird, which is a great favourite among Europeans in Ceylon, appears to have no choice of situation, frequenting gardens, cultivated districts, and open country, as well as thick jungle and the depths of the forest. In the vicinity of habitations, however, it is particularly at home, occupying the grounds of European and native houses, and therein delighting in the broad foliage of the "Lettuce"-tree and other umbrageous shrubs, about which it hops during the heat of the day, swaying its tail to and fro and repeating its continued and rather tiresome notes. The male during the breeding-season is most persistent in giving forth his sharp *te-wike, twike*, and his well-known metallic-sounding call somewhat like the sharpening of a saw, which he reiterates close to one's verandah in some adjacent tree till it becomes deafening. The muscular action consequent on the display of these vocal powers exposes the naked black skin (otherwise concealed) at the side of the throat, giving the appearance of a dark stripe at this part. Jerdon likened its call to the syllables *to-wee, to-wee, to-wee.* Although it usually consorts in pairs, it is not strictly a sociable bird, its companion being, for the most part, seen at some little distance off, now and then answering the notes with which it is hailed. After rearing its young brood, however, the little family go about in company for some months, flitting actively around and feeding on larvæ and insects which they secure among the leaves of trees. It is a bird of very restless habit, particularly in the breeding-season, and when watched at that period quickly disappears into the nearest thick foliage.

Nidification.—The breeding-season in the west and south of the island lasts from about March until November, during which period probably more than one brood is reared; in the Central Province it commences somewhat later, and in the north it is during the cool season or north-east monsoon. In the low

country an umbrageous tree with large leaves, more especially its favourite habitation the "Lettuce"-tree, is usually chosen in which to construct its ingenious nest, while in the Central Province it frequently builds in a coffee-bush, sewing four or five leaves together. Layard speaks of one being constructed of a dozen oleander-leaves; but the usual number of which it makes use is two. I have found beautiful nests constructed in a single leaf, the edges of the lower half being brought close together, sewn firmly, and the nest built into the cone thus formed, the back of the leaf serving for one half of the egg-cavity; but these are rare exceptions. Two, or perhaps three, adjacent leaves, about 4 or 5 feet from the ground, are selected and their ends brought together and so formed as to make a cavity for the nest, which is built inside it and consists of fine grass, bits of cotton, thread, coir-fibre, wool, small roots, and such like, some of which ingredients are passed through the holes perforated in the leaf casing and then incorporated with the body of the structure, the whole forming a very solid and substantial piece of workmanship. The coir used is mostly pulled from the mats in the verandahs of houses near which the nest is often built. The egg-cavity formed in this skilful manner is about 2 inches in diameter by the same in depth, the lining being simply the finer materials of the body of the nest. The eggs are generally three, sometimes four, in number, of a whitish or greenish-white ground-colour, spotted openly throughout, but chiefly at the large end, with one or two shades of rather light brown and brownish red. In shape they are rather pointed ovals, with but little gloss, and measure about 0·65 inch in length by 0·45 inch in breadth. Naturalists in India appear to differ in opinion as to the Tailor-bird using dead leaves for the formation of its nest. I have found and examined many and I have never seen such a thing. The most likely solution of the problem is that suggested by the late Mr. A. Anderson, and quoted in 'Nests and Eggs,' p. 33, and which is, that the dead leaves sometimes found in the composition of the nest are those which have been pierced to excess, separated from the stalk, and afterwards withered. Writers quoted in Mr. Hume's useful work testify to its building at all times of the year and in very various situations. Mr. Anderson speaks of a nest being taken in his presence from the very top of a high tree and enclosed within a single leaf; another seen by him was composed of seven or eight leaves. Miss Cockburn writes that it builds in coffee-trees in the Nilghiris. Mr. Hume gives the average length of Indian eggs as 0·64 by 0·46 inch.

Genus PRINIA.

Bill shorter, slenderer, and more curved than in *Orthotomus*. Nostrils linear and exposed as in that genus; tip entire. Wings as in the last genus. Tail variable, of 10 feathers in some, 12 in others, much graduated, the feathers lax. Tarsus long, shielded in front, with large but smooth scutes.

Nuchal "hairs" more developed than in *Orthotomus*.

PRINIA SOCIALIS.

(THE ASHY WREN-WARBLER.)

Prinia socialis, Sykes, P. Z. S. 1832, p. 89; Jerdon, Cat. B. S. India, Madr. Journ. 1839, xi. p. 3; Blyth, Cat. B. Mus. A. S. B. p. 143 (1849); Layard & Kelaart, Prodromus, Cat. App. p. 57 (1853); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 263; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 321 (1854); Jerdon, B. of Ind. ii. p. 170 (1863); Holdsw. P. Z. S. 1872, p. 455; Hume, Nests and Eggs, ii. p. 337 (1874); Legge, Ibis, 1874, p. 21, et 1875, p. 397; Hume & Butler, Str. Feath. 1875, p. 479; Morgan, Ibis, 1875, p. 321; Fairbank, Str. Feath. 1877, p. 406; Davidson & Wender, ibid. 1878, p. 83.

Foodkey Warbler, Latham, Hist. viii. p. 125.

Phutki, Hind. (Blyth).

Adult male and female. Length 4·5 to 5·0 inches; wing 1·75 to 1·9; tail 1·8 to 1·9; tarsus 0·75 to 0·85; middle toe and claw 0·55 to 0·6; bill to gape 0·65. Females are smaller, as a rule, than males.

Note. This species has 10 tail-feathers.

Iris pale red or brownish yellow; bill black; legs and feet fleshy reddish, claws dusky.

Male. Head, back, and wing-coverts dark bluish ashy, the colour just encircling the eye and covering the upper half of the ear-coverts; two long hairs spring from the nape on each side; wings and tail *umber-brown*; the tail with whitish tips and a subterminal blackish-brown bar, the central pair of feathers less lightly tipped than the rest, and all the bars showing darker beneath; under surface rufescent buff, paling to whitish on the centre of the breast, and tinged most deeply on the flanks with the rufescent hue; thighs brownish rufous; under wing rufescent. The plumage of the under surface is silky.

Female. Has a buff and more or less conspicuous *stripe above the lores*; under surface not so deeply tinged with buff as in the male.

Young. Similar to the adult, with the exception of the less pronounced hues of the upper surface, and more albescent character of the lower parts.

Obs. For want of South-Indian specimens to compare with those in my possession from Ceylon, I am at present, I regret to say, unable to deal satisfactorily with this species. I believe it will have to be separated as a smaller browner race of *P. socialis*; and I hope to refer to it again in the Appendix. It *may* turn out to be one of those forms which undergo a gradual change of plumage and size as they range south towards Ceylon, making it difficult to define their limits as distinct birds from their northern representatives; but even then I should almost doubt the propriety of not separating the Ceylon race as a subspecies. Sykes's male type of *P. socialis*, which was described from the Deccan, and is now in the India Museum, has the lower part of the back ashy, like the upper part, as in Ceylon birds; but the wings and tail are a decided brownish rufous, and consequently much redder than in the insular bird; the tail measures 2·2 and the wing 2·1 inches; another example (labelled ♀) has the wing 1·85 and the tail 2·3. There is a third example, from the Deccan (but not one of the types), which is similar to the above in coloration, and measures 2·1 inches in the wing and 2·4 in the tail. These Deccan specimens are nearer to our birds than those from more northern parts; but it will be seen at once how much the tail, in particular, exceeds that of the Ceylon birds; and the dark caudal bands are not so broad as in the latter. Travelling northwards we find some examples have the rump ashy, like the back, but with much longer tails than those from Ceylon, and others with the rump brownish rufous, running so much into *P. stewarti* (which species has the back overcast with an olivaceous hue, becoming quite rufous on the rump and upper tail-coverts) that I do not wonder that Mr. Hume considers the two species doubtfully distinct. A Sikhim example collected by Anderson, and labelled *P. socialis*, has the back similar to Sykes's specimens, and the wings and tail rufous-brown, somewhat approaching in colour those of Ceylonese birds; but the secondaries are edged with brighter rufous-brown, and the

tail, besides being very long (2·7), has the subterminal spots very narrow, as in Deccan skins. The determination of this bird appears to be correct, for it is much closer to the true *P. socialis* than to *P. stewarti*. The Ceylonese race might stand as *P. brevicauda*, if proved to be distinct.

Distribution.—This little bird is widely distributed both in the low country and the hills up to 5500 feet, but is nowhere very numerous. In the western and southern parts of the island it is found chiefly in paddy-fields and plots of Guinea-grass in the vicinity of native houses, as well as in other suitable spots in the interior. In the north I have met with it usually either in scrubby jungle interspersed with long grass, or in the dry grassy beds of large tanks, such as Hurullé, Toparé, or on the borders of Minery Lake and other large sheets of water. In the Central Province it is a common bird on the maana-grass patnas; and in Uva, where the large hilly wastes are suited to its habits, it is very frequently met with, and ranges up the Nuwara-Elliya road to within a short distance of Hakgala. I have seen it on the Elephant Plains, between Udu Pusselawa and the Sanatarium, and likewise in Lindula at an almost similar elevation, namely 5500 feet.

Jerdon writes of its range in India that it is only found in the south, and does not extend north of the Godaveri; of late years, however, it has been found to inhabit the north-western portions of the empire. At Khandala it is very common, as also in the Deccan, ranging southwards to the Nilghiris and other mountain-ranges, on which it is found, where their sides are grassy, up to 6000 feet. In the Carnatic it is met with among reeds and long grass by the sides of the rivers and tanks, and on the west coast it is, says Jerdon, found in similar situations. Captain Butler remarks that it is common on Mount Aboo; but the race which inhabits the adjoining plains appears to be a variety of *P. stewarti*.

Habits.—In the low country this species exhibits a tendency to wander about in search of localities favourable to its habits. It appears in fields of "Guinea-" and "Mauritius-grass" when they have grown up, rears its brood, and then departs on the field being cut; it finds a permanent home, however, in low grassy jungle, the sedge-covered borders of reservoirs and marshy places, and in the overgrown beds of large tanks. In the south of Ceylon it is a common bird about sugarcane-fields; in fact it is the characteristic Warbler of these localities, and may be seen clinging actively to the tall wavy stalks, energetically jerking its tail about and uttering its twittering little warble until disturbed by the approach of some one, when it drops suddenly into the brake and disappears. Its special delight is in the fields of tall Guinea-grass cultivated near towns and villages on the west coast; and it flits about in the dense cover which they afford, until some fine day its habitation is cut from under its feet and its retreat ruthlessly laid bare! It then vanishes, and takes up its quarters in the nearest favourable locality. I found great numbers of these birds in the long grass covering the dried-up tank of Hurullé, their companions in this thick vegetation being the Common Grass-Warbler and the White-browed Warbler. It is to be found permanently living in the maana-grass of the hill-patnas and on the bushy sides of the hills in the Fort-Macdonald district. Its food consists of insects; but occasionally I have found small seeds in its stomach. Its flight is weak and of short duration, for the tiny rounded wings with which nature has endowed it are not such as to afford it great powers of locomotion; it is very active in threading its way through long grass or reeds, and clings adroitly to upright stalks in its progress onwards. Sykes calls its flight a straggling one, as if it had a difficulty in making its way.

Nidification.—This Warbler breeds, both in the low country and in the hills, during the months of May, June, and July, constructing, as a rule, a very different nest from what is ascribed by some writers to its handicraft in India. There it is said to build generally a fabric resembling that of the Tailor-bird, using, however, more grass in its construction, and not sewing together the leaves with the same neatness as that species. I have found several nests in widely different parts of the island, and watched the birds building them, but in no case was there a single leaf of any kind present. For a description of one of the most remarkable, I quote the words of my note to Mr. Hume, published in 'Nests and Eggs,' Rough Draft, part ii. p. 337:—"In May 1870, a pair resorted to a Guinea-grass field attached to my house at Colombo, for the purpose of breeding. I soon found the nest, which was the most peculiarly constructed one I have ever seen. It was an almost shapeless ball of Guinea-grass roots, *thrown*, as it were, between the upright stalks of the plant about 2 feet from the ground. I say 'thrown,' because it was scarcely attached to the supporting-stalks at all. It

was formed entirely of the roots of the plant, which, when it is old, 'crop' out of the ground and are easily plucked up, the bottom or more solid part being interwoven with cotton and such like, to impart additional strength. The entrance was in the upper half of the side, and was tolerably neatly made; it was about an inch in diameter, the whole structure measuring 6 inches in depth by 5 in breadth." When this nest was finished and the complete clutch of three eggs laid, I took it; and the following day another was commenced and built in a similar manner. The time occupied in building these nests was about eight days. Other nests found in the Central Province were neat bottle-shaped structures of grass, fixed among the stalks of maana-grass, some of the fine blades being *sewn* through the stalks for stability; the openings were at the side, and the interior was roomy and lined with a finer description of the same material as the body of the nest. The number of eggs is three; they are pointed ovals, and possess a considerable gloss; they are of an almost uniform dull mahogany colour, showing indications of a paler underlying surface in parts, particularly at the small end. They measure about 0·65 inch by 0·46.

My experience, however, of this bird's nesting by no means compasses the question of its habits; for it is a bird which, like some of its congeners, the nearly-allied *P. stewarti* for instance, indulges in a very varied style of architecture. Two observers, Miss Cockburn and Mr. Davison, writing of the same district, the Nilghiris, give accounts of very differently-constructed nests. The former found them neatly built in Tailor-bird fashion, the bird drawing the leaves of the branches on which they were placed close together, and sewing them so tightly that the lining of fine grass, wool, and the down of seed-pods was supported by the framework thus made.

Mr. Davison, again, says that the nest is made of grass, beautifully and closely woven, domed, and with the entrance near the top; a third naturalist, Mr. Wait, found two nests in September—"the one deeply cup-shaped and the other domed; both constructed of root-fibre and grass, 'bents,' and down of thistle and hawkweed, all intermixed." Mr. Morgan says it constructs a very neat pendent nest, which is artfully concealed and supported by sewing one or two leaves round it, which is very neatly done with the fine silk that surrounds the eggs of a small brown spider. The eggs in all these nests are severally described as light red, deep brick-red (darker at the larger end, where there is generally a zone), and deep brownish red (deeper than brick-red), mottled with a still deeper shade. Mr. Hume's average for twenty-one eggs is 0·64 inch by 0·47.

PRINIA HODGSONI.

(THE MALABAR WREN-WARBLER.)

Prinia gracilis (Franklin), Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. p. 3.

Prinia hodgsoni, Blyth, J. A. S. B. 1844, xiii. p. 376; id. Cat. B. Mus. A. S. B. x. p. 143 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 322 (1854); Jerdon, B. of Ind. ii. p. 173 (1863); Hume, Nest and Eggs, ii. p. 342 (1874); Legge, Mem. B. Hambantota, Ceylon Blue-book, 1874, p. 9 (first record from Ceylon); id. Str. Feath. 1875, p. 203; id. Ibis, 1875, p. 397; Oates, Str. Feath. 1875, p. 136; Butler & Hume, *t. c.* p. 480; Bourdillon, ibid. 1876, p. 401.

Prinia albogularis, Walden, Ann. & Mag. Nat. Hist. 1870, v. p. 219.

Prinia pectoralis, Legge, Mem. B. Hambantota, *ut suprà*, note.

The Small Wren-Warbler, Jerdon; *The Slaty-breasted Wren-Warbler, Hodgson's Wren-Warbler. Phutki*, Hind.

Adult male and female. Length from 4·3 to 4·6 inches; wing 1·65 to 1·85; tail 1·85 to 2·0; tarsus 0·7 to 0·75; mid toe and claw 0·52 to 0·57; bill at front 0·55 to 0·58. Females are, on the average, the smaller of the sexes.

Note. This species*, together with *P. gracilis* and *P. cinereocapilla*, has 12 tail-feathers.

Male. Iris reddish yellow; eyelid brownish yellow; bill black; legs and feet fleshy yellow, in some a faint tinge of brown on the tarsus; claws brown.

Head, hind neck, back, and wing-coverts dusky cinereous ashy, with a slight olivaceous tinge on the back, and the rump somewhat pale; wings and tail hair-brown, the latter tipped whitish, with an adjacent blackish bar, showing darkest beneath and almost obsolete on the centre feathers; edges of the quills lighter than the rest of the feather; beneath white, with a broad cinereous ashy pectoral band, above which the throat is tinged with buff; flanks concolorous with the chest; thighs fulvous-brown.

Female. Iris as in the male; tarsus not so clear in colour. Less cinereous above, wings paler brown; a light streak above the lores; the pectoral band about the same width, but *much paler*; flanks the same.

Young. In the nestling just fledged the iris is olive; bill dark brown, yellow beneath at base; legs and feet brownish yellow, claws light yellowish.

Above brownish olivaceous, inclining to rusty on the rump; wings brown, edged with light ferruginous; beneath white, a faint dark band across the chest, and a slight tinge of buff over the whole; edge of wing white.

For some little time the upper parts remain the same, but the pectoral band darkens, the tips of the rectrices are whiter than in the adult, and the soft parts undergo a gradual change; the iris becomes yellow, the bill blackish, with a pale base below, and the legs less brownish. At the end of the first year the head is cinereous as in the adult, but the back is more olivaceous, the wing-coverts and quills still edged rusty, and the pectoral band of not quite the normal depth, with the lower parts tinged still with buff.

During nonage females are distinguishable at all stages by the pectoral band being lighter than in the male, and slightly incomplete in the centre.

Obs. Examples of this species procured by me in Ceylon in 1873 were identified by Mr. Blanford as identical with his Nellore specimens, which he had compared with the types of Lord Walden's *P. albogularis* from Coorg and which corresponded with them. Misled by the omission of all mention of the pectoral band in Jerdon's description, and not possessing Indian specimens for comparison, I had, on first discovering the species in Ceylon, come to the conclusion that it was new, and had named it, in my manuscript for a paper I was writing at the time, *P. pectoralis.* I have been unable to compare South-Indian specimens with mine, as the series of *Prinia*-skins in the British Museum is scanty; but, in addition to the above evidence, Mr. Fairbank writes me that a specimen he got at the base of the Mahabaleshwar hills had a broad dark slaty band across the chest. Captain Butler and Mr. Oates both refer to the dark band across the chest in this species; and therefore I conclude that Ceylon specimens will

* It has been stated that Jerdon erroneously described this species as having 12 tail-feathers. It, however certainly has 12.

compare well with those from all parts. But two or three examples I inspected in the national collection from Bhotan and Burmah, labelled as *P. hodgsoni*, had nothing but a slaty wash over the chest, blending imperceptibly into the surrounding white, and not taking the form of even a pale band; they were rufescent brown above, and the quills were edged with the same colour; the lower parts were likewise washed with buff instead of being pure white; they resembled *P. gracilis* above, but had the chest darker than that species, which may be said to be, in its plumage, an ally of *P. hodgsoni*, and has the upper surface, wings, and tail rufous-brown, and the underparts silky white, shaded with greyish on the sides of the neck.

Distribution.—The present species is of local range in Ceylon, and was unknown in the island until I discovered it in 1873, near Hambantota. I found it subsequently all over the Wellaway Korale, the Magam Pattu, and in other parts of the south-east, as far up the coast as Batticaloa. On the road from that place to Badulla I met with it frequently, and traced it as far up as Passara, between which and the skirts of the Madulsima district, where the range descends suddenly into the Nilgalla country, it was tolerably common. I have not seen it to the north of Vendeloos Bay, nor west of Hatagalla, on the Tangalla road.

In regard to the reference *P. pectoralis* in the synonymy of this article, I may mention that the memorandum of the birds inhabiting the Hambantota district of the south-east of Ceylon was written at the request of my friend Mr. Thos. Steele, C.C.S., Government Agent of that part, to be embodied in the reports of the Ceylon Blue-book for 1874, relating to the district in question; it contained a list of 190 species, with some remarks on their distribution, and was printed at the Government Offices in Colombo.

On the mainland this *Prinia* is, according to Jerdon, to be found "all through the Malabar coast, the Wynaad, the slopes of the Nilghiris, and more rare on the Eastern Ghâts and in wooded valleys at the northern termination of the tableland." As already mentioned, Mr. Blanford has it from Nellore on the east coast; and Mr. Fairbank records it from the base of the Khandala hills. Mr. Ball has procured it at Sambalpur; and to the north-west it is found in the Mount-Aboo district, the avifauna of which is much the same as that of the Western Ghâts, it being, as it were, a northerly but isolated spur of this range. Mr. Hume remarks that it is found in the adjacent hill-ranges of Girwar in Kattiawar and of Koochawun. It extends eastward along the sub-Himalayan region through Bhootan and Nepal (that is, if the species there be identical with the southern form), and is found in Burmah, concerning which region Mr. Oates writes that round Thayetmyo it is common.

Habits.—This tiny Wren-Warbler is more arboreal in its habits than its other congeners of Ceylon; it frequents the edges of low jungle, underwood at the sides of the roads and jungle-paths, and also the tangled vegetation with which badly-cultivated cheenas or deserted forest-clearings are overgrown. It is a more sociable bird than *P. socialis*, little troops of three or four consorting together and following each other from bush to bush, or moving about in the underwood in a restless manner, all the while giving out a feeble sibilant utterance. In the early morning I often found these little families by the sides of the roads and paths in the hot dry jungle of the south-eastern district, and was enabled to procure the young in all stages, from the nestling to the immature bird acquiring the dark pectoral band; their flight was very short and feeble, and, after alighting in a bush or shrub, they had the faculty of quickly threading their way to the further side, from which they again took flight. The food of this bird consists of small insects, which it picks up among the dead wood to which it is so partial. Mr. Bourdillon remarks that it has a feeble twittering song; and Mr. Oates writes that the "male sits on the topmost twig of a bush, and sings a tremendously hearty little song." I have only heard the feeble chirping above mentioned, which I conclude must be the usual call-note of the species.

Nidification.—I never succeeded in finding the nest of this Warbler, but know that it breeds in May and June, from the number of young birds I met with in July in the low country below Lemastotta. Mr. Hume and his correspondents, cited in 'Stray Feathers,' describe its nest as quite Tailor-bird like, composed chiefly of fine grass, with no special lining, carefully sewn, with cobwebs, silk from cocoons, or wool, into one or two leaves, which often completely envelop it, so as to leave no portion of the true nest visible. The ground-colour of the eggs is very delicate pale greenish blue, and the markings differ so much as to divide them into two "distinct types"—the one unspotted, and the other finely speckled throughout with brownish or purplish red, frequently forming a zone towards the large end. They vary from 0·53 to 0·62 inch in length, by from 0·4 to 0·45 in width.

Genus DRYMŒCA.

Bill stouter and shorter than in the foregoing genera of the subfamily. Nostrils linear; rictal bristles stout but few. Wings with the 4th, 5th, and 6th quills the longest, and the 1st more than half the length of the 5th. Tail of 10 feathers, graduated and moderately long. Legs and feet stout; tarsi covered with strong and prominent scutæ, and longer than the middle toe and claw; claws strongly scaled; hind toe and claw large.

Nuchal hairs much developed in some species.

DRYMŒCA VALIDA.

(THE ROBUST WREN-WARBLER.)

(Peculiar to Ceylon.)

Drymoica robusta, Blyth, J. A. S. B. 1849, xviii. p. 812; id. Cat. B. Mus. A. S. B. p. 142 (1849).

Drymœca valida, Blyth, J. A. S. B. 1851, xx. p. 180; Kelaart, Prodromus, Cat. p. 120 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 262; Blyth, Ibis, 1867, p. 302.

Drymoipus validus, Jerdon, B. of Ind. ii. p. 182 (1863); Holdsworth, P. Z. S. 1872, p. 457; Legge, Ibis, 1874, p. 21, et 1875, p. 397.

Suya robusta, Bonap. Consp. vol. i. p. 281 (1850).

Similis *D. jerdoni*, sed robustior, alis caudâque longioribus, et rostro toto nigro, robustiore et magis curvato distinguenda.

Adult male and female. Length 6·0 to 6·4 inches; wing 2·3 to 2·5; tail (varies much) 2·4 to 2·8; tarsus 0·95; mid toe and claw 0·5 to 0·7; bill to gape 0·7 to 0·75.

Iris light reddish or reddish grey; eyelid and bill* black, in some with the base very slightly pale; inside of mouth *black*; legs and feet fleshy or fleshy reddish, claws brownish.

Above greyish brown, slightly cinereous on the sides of the neck; wings and tail brown, with rufescent grey edgings to the quills and coverts, and the tail with whitish tips and subterminal blackish-brown bars, indistinct on the central rectrices; these latter have obsolete dark cross rays; lores dark grey, surmounted by a just perceptible streak of whitish; cheeks brownish, the lower parts blending into the colour of the throat and crossed by narrow dark lines; beneath fulvescent whitish, with the buff tinge strongest on the chest and sides of the belly close to the flanks, which darken into cinereous grey; thigh-coverts pale fulvous brownish.

Young. Iris whitish or greyish yellow; bill brown; under mandible fleshy with dusky tip; legs and feet fleshy reddish, or more delicate in hue than the adult.

Above rufescent brown; loral spot small; wings and tail edged with faded rufous; the tips of the rectrices, which are subeven, fulvous white, and the dark spots lighter than in the adult; cheeks washed with brownish; beneath white, strongly tinged with rufescent buff on the chest and sides of belly; under tail-coverts dusky buff.

Obs. This species has, like many others in Ceylon, a representative form in South India, the Jungle Wren-Warbler, *D. sylvatica*. This bird, which is found in many parts of the peninsula and ranges up the Nilghiris to an elevation of 4000 feet, is paler on the upper surface and has a plainly developed superciliary streak. I have not had an opportunity of examining this species; but it is evidently exceedingly close to the present, as is also the next bird. The *Dymœcinæ* of India, as Mr. Hume has more than once remarked, want reviewing exceedingly; and I trust

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* The bill in this species frequently dries in the specimen, so as to leave the base of the under mandible white.

that when he amasses a large enough series he will publish a monographic notice of them, determining once and for all which are and which are not good species. I regret to say that, owing to a want of Indian material, my treatment of the Ceylon members of this genus must needs be very imperfect.

Distribution.—This is one of the many species discovered by our indefatigable ornithological pioneer Layard; he procured it in 1848, and on sending it to Blyth this naturalist named it primarily *D. robusta*, but two years afterwards gave it its present title, the reason for this change of name being because *D. robusta* was preoccupied by another species described by Dr. Rüppell.

Layard does not seem to have become well acquainted with it, for he speaks of it as "rather a rare bird," and as such it was likewise considered by Mr. Holdsworth. It is, however, a common bird, frequenting the cinnamon-gardens in the environs of Colombo, and also every similar locality along the western sea-board; in the interior it is found by the sides of roads and in low scrubby land near paddy-fields or semicultivated native gardens. In the south-west it is of frequent occurrence. In the eastern portion of the island, from Hambantota round the coast to the Trincomalie district, it is usually found in jungle clearings in which low bushes have sprung up; and these are, in fact, its favourite localities throughout the wilder northern half of Ceylon. In the hilly districts of the Morowak and Kukkul Korales it is fond of kurrakan-fields, and in the Central Province may usually be seen in the hill paddy and among the long grass of the patnas. In the western portion of the hill-zone I have not detected it above 3000 feet; it is common at a higher altitude between Badulla and Haputale, where the vast stretch of patna-hills affords a considerable tract of country suitable to its habits and nature.

Habits.—As will be gathered from my remarks on its distribution, this species delights in any situation affording the cover which it frequents, such as low grassy jungle, open scrub, brambly wastes, the borders of paddy-fields, rank patna vegetation, the sides of roads through jungle and deserted forest clearings, or rude cultivation near jungle-begirt tanks. It passes most of its time near the ground, searching in thick grass and undergrowth for insects, often flying up to the top of the bush which has afforded it shelter; here it sits motionless for some little time, and commences suddenly to reiterate its loud clear call. It is particularly noisy in the afternoons, and is able, in the stillness of the evening, to make itself heard at no little distance as it sits on the top of a fence or dead stump in a solitary jungle clearing. It has but little pretension to the name of Warbler; but there are perhaps few birds which endeavour to make themselves heard more than it, or which give one the impression of trying to proclaim their whereabouts to all their neighbours. When it desires to give out the singular ringing note of which it is possessed, it invariably mounts to the very top of a bush, and having commenced its call continues lustily with it until disturbed, when it often remounts to an adjacent shrub and prolongs its evening salutation. It is equally noisy throughout the year; and I have no doubt its notes are well known to most of the residents in the handsome bungalows now adorning the cinnamon-gardens of Colombo, as well as familiar to those who take an afternoon's drive round the "Circular," or on the many radiating roads which start from that pretty spot. It often descends to the ground and feeds among grass, and when wounded I have seen it run with considerable facility. Its diet is purely insectivorous; and Layard remarks that it hunts in small parties, and traverses the branches up and down in a similar manner to the Tailor-bird. I have usually seen it solitary, and it is rare to see more than two or three together.

In the Plate accompanying the article on *Drymœca insularis* will be found a figure of the present species, taken from a male example shot in the Kalebokka district, Central Province.

DRYMŒCA JERDONI.

(JERDON'S WREN-WARBLER.)

Drymoica jerdoni, Blyth, J. A. S. B. 1847, xvi. p. 459; id. Cat. B. Mus. A. S. B. p. 142 (1849).
Drymoica inornata (Sykes), Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 328 (1854), in pt.
Drymoipus jerdoni (Bl.), Jerdon, B. of Ind. ii. p. 180 (1863); Holdsw. P. Z. S. 1872, p. 456; Hume, Str. Feath. 1873, p. 437; Legge, Ibis, 1874, p. 21.

Adult male and female. Length 6·0 inches; wing 2·1 to 2·3; tail 2·45 to 2·6; tarsus 0·75 to 0·85; middle toe and claw 0·75; bill to gape 0·71 to 0·74.

Iris pale reddish or yellowish red; bill, upper mandible dark brown, lower dusky, pale at the base; inside of mouth *flesh-colour*; legs and feet brownish fleshy, claws blackish.

Above olivaceous brown, not so dark as the last species; the lores brownish grey; wings darker brown than the back, the quills edged pale; tail slightly paler brown than the wings, with obsolete transverse striæ, all but the central feathers with a pale tip and narrow subterminal dark bar showing beneath; face and ear-coverts pale brownish, mingled with the albescent hue of the throat; under surface, from the chin to the under tail-coverts, fulvescent whitish, most strongly tinged with buff on the sides of the chest and on the flanks; under wing-coverts and inner edge of quills fulvescent; thighs brownish fulvous.

Young. Iris as in the adult, bill with the under mandible lighter, and the tarsus washed with brownish.

An individual shot in June, and seemingly about two months old, has the upper surface of a more earthy hue than the adult; the quills are edged with fulvous, and the tertials have a broad but indistinct pale cross band formed by the margins of the centre of the feathers being fulvous: tips of the tail-feathers fulvous, and the subterminal dark spot indistinct.

Obs. This species is very close to the last. It may, however, be distinguished from *D. valida* by its having a *straighter, slenderer, and paler bill, and a flesh-coloured mouth*, by the wing being shorter, and the tarsus not so stout and studded with less prominent scutæ. As a rule, the brown of the upper surface is paler, and the lores are lighter, although much stress cannot be laid on this last character, as the lores are variable in the last species, being, in some specimens, nearly as pale as in the present bird. Neither can any dependence be placed on the tint of the under surface, for it is, in many specimens of *D. valida*, quite as much tinged with buff as in this species.

Specimens of this Warbler were sent by Jerdon from Southern India to Blyth, who described it under its present title, but afterwards absorbed it into *D. longicaudata*. Jerdon, however, sent examples to the British Museum, and with these Mr. Holdsworth compared his Ceylonese skins and found them to agree. But little is known of this species in Southern India—that is, as far as we can judge from the experience of late observers, not one of whom mentions it among the collections which have from time to time been described in 'Stray Feathers.' I imagine, therefore, that its distribution must be very local or that it must be a rare species.

Distribution.—Jerdon's Wren-Warbler is widely diffused throughout the low country, but is nowhere very common. It occurs, but only sparingly, according to my experience, in the hill-country up to about 3500 or 4000 feet, at which elevation I have met with it in the Knuckles district. Mr. Holdsworth procured his specimens near Colombo, and I found it commoner there than anywhere else. It frequents the cinnamon-gardens, chiefly affecting those low-lying spots which are overgrown with fern and bracken. I have procured it in the Eastern Province, also in clearings in the Kukkul Korale, and I have no doubt that some of the many birds of this genus which I have seen in the south-eastern region and the Northern Province may have belonged to the present species. It is not possible to distinguish it from the last bird when at large, and it may not, therefore, be so sparsely diffused through the island as I suppose; at the same time, however, I may mention that the majority of specimens of these large Wren-Warblers which fell to my gun in various parts of Ceylon belonged to the last-named, *D. valida*.

Concerning its distribution in South India I am unable to give particulars. I conclude it occurs in suitable localities in the low country of Madras, and probably on the slopes of such ranges as the Palanis.

Habits.—This bird frequents fern-brakes, the sides of overgrown ditches, long grass, and "hill-paddy" fields. It is of a sneaking disposition, keeping as much as possible under cover, and when roused from its haunts it flies along near the ground and quickly reestablishes itself in some thick vegetation. It has none of the bold habits of the Ceylon Wren-Warbler, although at eventide I have often heard it pouring out its warble, but not from a prominent position, as is the custom of its insular ally. Its food consists of various small Coleoptera and other minute insects. Its notes are moderately loud, but not so shrill as those of *D. valida*.

Nidification.—I have never found the nest of the present species, but have obtained fledgings in the Eastern Province in September. It breeds, therefore, on that side of the island in July or August, and on the west most probably from March until June.

DRYMŒCA INSULARIS
DRYMŒCA VALIDA

DRYMŒCA INSULARIS.

(THE WHITE-BROWED WREN-WARBLER.)

(Peculiar to Ceylon ?)

Drymœca inornata, Blyth, Cat. B. Mus. A. S. B. p. 142, spec. F (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 263; Layard & Kelaart, Cat. B. App. Prodromus, p. 57 (1853).

Drymoipus inornatus, Legge, J. A. S. (Ceyl. Br.), 1870–71, p. 50; Holdsw. P. Z. S. 1872, p. 456; Hume, Str. Feath. 1873, p. 439; Legge, Ibis, 1875, p. 396.

The Plain-Warbler, *Grass-bird*, Europeans in Ceylon.

Adult male and female. Length 4·9 to 5·4 inches; wing 1·85 to 2·15; tail 2·1 to 2·5; tarsus 0·8 to 0·9; hind toe and claw 0·58 to 0·61; bill to gape 0·65 to 0·68.

Iris very pale reddish or reddish yellow, a dark, thin, outer ring generally visible; eyelid reddish; bill black, with a clearly-defined white base; legs and feet flesh-colour or fleshy grey, claws dark brown.

Above dull cinereous or greyish brown, pale on the rump and tinged with chestnut on the head; wings and tail brown, edged with rufescent greyish; centre rectrices with faint cross rays; tips of rectrices white, with an adjacent blackish spot, both showing most beneath and least defined on the centre pair; a conspicuous white supercilium spreading over the lores, except at the corner of the eye, which is brown; orbital fringe whitish, with the posterior corner rufescent brown; beneath white, tinged with buff, most strongly on the sides of the chest and belly; flanks slightly dusky; under wing and under tail-coverts buffy white; thighs fulvous-brown.

I do not observe any constant difference in the plumage of adults in the winter. Some specimens are certainly darker in the cool season than the generality of breeding birds; but I have an example, shot from the nest in July, quite as dark as one killed at the latter end of October. The tail is, if any thing, *shorter* in winter than in summer.

Young. Iris greyish; bill, upper mandible brown, lower fleshy, with a dusky tip; legs and feet pinkish flesh-colour.

Upper surface rufescent brown; the wings broadly margined with brownish rufous; tail tipped fulvous, with a trace of the subterminal bar; supercilium narrow and buff-white, under surface more washed with fulvous buff than the adult.

The tail is *even* in the nestling, the lateral feathers being nearly as long as the centre pair.

Obs. This Wren-Warbler has hitherto been united with the Indian species, *Drymoipus inornatus*, Sykes, to which it is, indeed, very closely allied. I will, however, keep it distinct, on account of its shorter tail, generally smaller size, and darker summer plumage, which differences, I find, exist between it and the type of the above-mentioned species, which is preserved in the India Museum. Mr. Brooks has lately compared this specimen, which is from the Deccan, with others of the northern race, which he and Mr. Hume have recently demonstrated to possess a distinct summer and winter plumage, and he finds that it is identical with them. In his notice on this subject ('Stray Feathers,' 1876, p. 407), Mr. Hume contrasts the winter phase (*D. longicaudatus*, Tickell) with the summer (*D. terricolor*, Hume) as follows:—

"*Drymoipus inornatus.* Winter, *longicaudatus*: lower surface warm buff; upper surface strongly rufescent; wings hair-brown, strongly margined with dull ferruginous; tail 3·2 inches, rufescent brown. Summer, *terricolor*: lower surface white, with a faint yellowish tinge; upper surface dull earthy grey-brown; wings earthy brown, margined albescent; tail 2·5, central feathers pale earthy brown."

Now although, as I have above remarked, some winter specimens of our bird are darker than some summer ones, no such thorough change or increased length of tail takes place as I have just quoted; and as Mr. Brooks says ('Str. Feath.' 1876, p. 274) that Sykes's type of *Drymoipus inornatus* is in the *longicaudatus* or dark winter plumage of *terricolor*, it follows that it must be a different bird from ours. Touching Mr. Brooks's decision, however, I would remark that Mr. Moore and myself have compared a pale summer-plumaged Ceylon specimen with Sykes's type, and find that the latter is the paler of the two, so that it cannot well be as dark as the above diagnosis of Mr. Hume, and likewise former writings of Mr. Brooks's on the subject, would lead one to suppose *D. longicaudatus* really is. Furthermore it would be necessary to possess summer specimens of the Deccan bird (there is no date of procuring on Sykes's specimen) before a decided opinion could be pronounced whether it was identical with the northern form. But whether Mr. Brooks be right or not, Sykes's bird does not agree well with ours; for besides

being paler than even a summer example of the latter, it is 0·37 inch longer in the tail and a trifle shorter, notwithstanding, in the wing: the eye-stripe is not so conspicuous and the bill is paler, the ground-colour of the tail darker beneath, with the blackish subterminal bars not so conspicuous. Another example of Sykes's measures 2·15 in the wing and 2·9 in the tail. As our bird, therefore, cannot be united to *D. inornatus*, it remains to be seen whether it is the same as the species inhabiting the Nilghiris and Southern India generally, and which Mr. Hume says should stand as *D. fuscus*, Hodgson. The natural inference would be that it is so; but Mr. Hume points out that the Nilghiri bird is larger, and has not so slender a bill as the Ceylonese; and I observe, furthermore, that its eggs are marked with fine hair-lines or streaks, which is never the case, to my knowledge, with the Ceylonese race, the eggs of which are always spotted openly with rather large blotches. I have therefore decided to separate our bird as an insular though closely allied race to the Deccan form, which, I have no doubt, will prove to be the same as the South-Indian species, now styled *D. fuscus*.

Distribution.—This sprightly little bird is about equally common with *Prinia socialis*, being widely distributed throughout the low country, as well as an inhabitant of the Kandyan and Southern-Province hills up to an altitude of about 5000 feet. At this height it is to be found on patnas in Uva, Haputale, and the slopes of Northern Saffragam, in which I include the sides of the ranges from Haldamulla round to Ratnapura; it also affects grassy spots and paddy and hill-grain fields in most of the upland valleys of the Central Province. In the Western Province it inhabits the Guinea- and Mauritius-grass fields in the neighbourhood of towns and villages, and in the interior is to be found in paddy-fields as soon as the grain is of sufficient length to afford it cover. In the Galle district I have often detected it in sugar-cane cultivation, and in the eastern and northern province it inhabits sedges and long grass in the beds of dried-up tanks.

Habits.—This Warbler frequents grass-fields, tall paddy and other native cereals, and long grass or tussocky wastes of all kinds, such as are found in the dry beds of tanks, on open plains, or the sides of hill-patnas. It is an active little bird and generally found in pairs, which flit about the tall corn, alighting on, and clinging with ease to, the most pliant stalks, while they constantly utter their repeated note, *kink-kink-kink*. Several pairs frequented the Guinea-grass near my quarters on the Galle face, and, together with the Ashy Wren-Warbler and the little Grass-Warbler, conduced to make the little field an interesting resort of small birds. I found it in great abundance in the bed of Hurullé tank, which, in the dry season, is a vast area of long grass; to such large tracts as this, as well as to extensive paddy-fields, it usually flocks for the time being, taking itself off again when its shelter is removed by fire, water, or the hand of the reaper. It consorts much with the Ashy Prinia, and at a distance is with difficulty distinguished from that species, except by its note. I have found the nests of both in close proximity to one another. It has a weak jerky flight, sustained for a short distance only, and it is insectivorous in diet, feeding on small caterpillars, larvæ, minute insects, &c.

Nidification.—I have found the nest of this species in almost every month from February till November; the prevailing time, however, in all parts of the island is from May until June, birds breeding in October and November being probably in the act of rearing a second brood. It builds its neat and cleverly-constructed nest between the tall stalks of paddy or other cultivated species of grass, about 3 feet from the ground. The egg-cavity is very deep for its width, for the better security of its contents, which are liable to be swayed to and fro with the wind. The nest is sometimes dome-shaped, with the top forming a hood over the entrance, which, in some instances, is neat and rounded, and in others wide and unfinished. Many, however, have an ingeniously made roof of the green blades of the supporting stalks, cleverly bent down and interlaced. The body of the nest is constructed of strips of green grass, generally sewn into the stalks at the bottom to form a secure foundation, the rest being woven round them to form the walls; the lining consists of finer strips of grass, scantily arranged in some cases, so that the bottom can be plainly seen through. The interior usually measures 2 inches in width by 3 in depth. The eggs are almost invariably 4 in number, of a beautiful blue ground-colour, very handsomely though sparingly blotched with rich umber and sepia blotches of two shades, which in some examples are gathered mostly round the larger end. They measure from 0·6 by 0·47 to 0·67 by 0·49, and the period of their incubation is from 11 to 13 days. They are almost entirely hatched by the heat of the atmosphere in fine weather, the bird resorting to the nest at sundown and leaving it again in the morning.

The figure on the Plate accompanying this article is that of a male shot in July at Hurullé tank.

Genus CISTICOLA*.

Bill more compressed than in *Drymœca*, high at the base, the culmen moderately curved; rictal bristles small and fine. Wings ample, with the secondaries much curved, the 1st quill less than half the length of the 4th, 5th, and 6th, which are subequal and longest, the 2nd shorter than the 7th, which is slightly less than the 6th. Tail of 12 feathers, and not exceeding the wing, the lateral feathers graduated. Legs long; the tarsus exceeding the middle toe and its claw, and shielded with broad smooth scutæ. Toes delicate; hind toe and claw large.

Plumage above striated. Nape furnished with short hair-plumes.

CISTICOLA CURSITANS.

(THE COMMON GRASS-WARBLER.)

Prinia cursitans, Frankl. P. Z. S. 1831, p. 118; Jerdon, Ill. Ind. Orn. pl. 6 (1847).

Cisticola schœnicola, Bonap. Geogr. and Comp. List B. of Eur. p. 12 (1838); Jerdon, B. of Ind. ii. p. 174 (1863); Shelley, Ibis, 1871, p. 133; id. B. of Egypt, p. 97 (1872); Holdsw. P. Z. S. 1872, p. 455; Hume, Str. Feath. 1873, p. 439; id. Nests and Eggs, ii. p. 343 (1873); id. Str. Feath. 1874, p. 235, et 1875, p. 137; Butler & Hume, *t. c.* p. 481; Irby, B. of Gibraltar, p. 91 (1875).

Cisticola cursitans (Frankl.), Blyth, J. A. S. B. xvi. p. 457 (1847); id. Cat. B. Mus. A. S. B. p. 145 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 324 (1854); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 262 (in pt.); Hume, Str. Feath. 1877, p. 90; Davison & Hume, B. of Tenass. ibid. 1878, p. 349.

Cisticola omalura, Blyth, Cat. B. Mus. A. S. B. p. 145 (1849); id. J. A. S. B. 1851, xx. p. 176; Kelaart, Prodromus, Cat. p. 120 (1852) (in pt.); Layard, *ut suprà*, p. 262 (in pt.); Blyth, Ibis, 1867, p. 302; Legge, Ibis, 1874, p. 21.

Drymœca cisticola, Von Heuglin, Ibis, 1869, p. 132.

Cisticola homalura, Hume, Str. Feath. 1877, p. 93.

The Mountain Grass-Warbler (*C. omalura*); *The Grass-Warbler* (*C. cursitans*), Kelaart; *The Fan-tail Warbler*, Shelley; *Bou-fesito*, Moorish, lit. "Father of eloquence;" *Cierra-puño, Tin-Tin* (from its note), Spanish; *Bolsicon*, Spanish (Saunders). *Ghaska phutki*, Hind., lit. "Grass-Prinia;" *Kher ghusa*, Hind. at Bhagulpore (Jerdon); *Chittu kuruvi*, lit. "Small bird," Ceylonese Tamils.

Adult male. Length 4·0 to 4·6 inches; wing 2·0 to 2·3; tail 1·3 to 1·6 (lateral feather from 0·3 to 0·5 shorter than central); tarsus 0·7 to 0·8; mid toe and claw 0·59 to 0·65; bill to gape 0·55 to 0·61.

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* This peculiar genus, on account of its short 1st and long 2nd quill, and likewise its striated plumage, appears to form a link between the Drymœcine division of the Timaliidæ and the Sylviidæ, which latter family I propose to place next in order to the present. Notwithstanding these characters, the rounded form of the wing, the lengthened secondaries, the stout legs and feet, and the graduated tail ally *Cisticola* to the Drymœcinæ, in which subfamily Jerdon placed it.

Female. Length 3·9 to 4·3 inches; wing 1·9 to 2·05.

Iris varying from greyish yellow to olive-grey or pale olive; bill fleshy, the culmen varying from dusky to blackish brown, tip of lower mandible dusky; inside of mouth in the male *black*, in the female *fleshy*; legs and feet fleshy; joints of toes dusky.

Male (Hambantota, 30th June). Centres of the hind neck, back, scapulars, and wing-coverts deep sepia-brown, paling gradually off at the margins into brownish rufescent and rufescent greyish, the wing-coverts and scapular feathers having the lightest edgings; forehead and sides of the crown uniform sepia-brown, but the feathers of the centre of the occiput and of the nape and hind neck indistinctly edged with rufous-grey; tertials and the innermost feathers of the greater coverts brownish black, broadly edged with fulvous greyish; primaries and secondaries dark brown, edged with greyish; rump brownish rufous; upper tail-coverts dark brown at the centres of the feathers; central tail-feathers and a subterminal band on all the rest black-brown, these latter deeply tipped with whitish, which, together with the black bar, is clearer and more conspicuous beneath; above the bar a rufous patch, chiefly confined to the inner webs of the feathers.

Lores and supercilium whitish, a small dark spot just in front of the eye; face and ear-coverts rufescent, the latter with pale shafts; throat and under surface white, changing on the flanks and under tail-coverts into rufescent; wing-lining tinged with the same; thighs pale rufous.

Colombo (27th January and 8th February). These two examples have the feathers of the centre of the crown very faintly margined with fawn-colour, the head being scarcely less uniform than in the above; the feathers of the back are darker, as also the wings; rump deeper rufous.

Galle (12th April). Head almost uniform brown; margins of the feathers just perceptibly paler than the rest of the web.

Colombo (26th October). Feathers of the crown conspicuously margined with pale fawn, the forehead uniform, and the brown tint of the head very dark.

Horton Plains and Kandapolla (January). These birds are darker above than low-country ones; the margins of the feathers are more greyish than rufescent, the rump rufous-brown, and the tail-feathers with the tips not so white as in the above detailed examples; the spot in front of the eye is darker, and the bill is also blackish; the under surface is not so white, but is pervaded with greyish on the chest, and the flanks are brownish rufous; the head is more plainly striated than in any lowland birds.

It will be seen from the above that there is but little difference in Ceylon specimens in summer and in winter plumage,

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Genus SCHŒNICOLA * (?).

Bill straight, the culmen curved, compressed, rather deep at the base; the tip slightly notched. Nostrils oval and placed well forward; two or three stout rictal bristles, one of which is much longer and stouter than the others. Wings rounded, the 1st quill more than half the length of the longest, which is the 3rd; the 2nd subequal to the 5th. Tail long, of 10 feathers, the middle pair very broad, the laterals graduated. Tarsus long, covered with broad transverse scutæ; middle toe long, the lateral ones subequal and reaching to the last joint of the middle one; claws very straight.

SCHŒNICOLA PLATYURA (?).

(THE BROAD-TAILED REED-BIRD.)

Timalia platyura, Jerdon, Cat. B. S. India, Madr. Journ. 1844, xiii. no. 96 *bis*.
Schœnicola platyura, Jerdon, B. of Ind. ii. p. 73 (1863); Hume, Str. Feath. 1878, p. 37.

Adult (Ceylon: ex Cuming). Length from skin, which is rather stretched, 6 inches; wing 2·6; tail 2·7; tarsus 0·9; middle toe 0·7; bill to gape 0·61. Lateral tail-feathers 1·3 shorter than the central pair, which are 0·15 longer than the adjacent ones; under tail-coverts 0·3 shorter than the outermost pair.

Head, hind neck, back, scapulars, and rump ruddy brown, darkest on the head, and inclining to rufous-brown on the

* These are the characters of a bird presumed to belong to this genus, which is now in the British Museum.

the up-country birds cited proving, however, an exception: in breeding-plumage the head is somewhat more uniform than in winter; but there is in this sex always an absence of that striation which is characteristic of the other; some birds at the autumn moult retain the dark head more than others.

Female. Galle (June). Edges of the feathers of the head dusky buff, and those of the back conspicuously wide.

Colombo (September: two examples). Head and upper surface the same as in the above.

Horton Plains (January). Head striated, edgings of back-feathers very dusky; rufous of the lower back the same; flanks dark; spot in front of the eye not so dark as in the male. At all seasons the head of the female is striated, owing to the light edgings of the feathers.

The length of the lateral tail-feathers, and also of the adjacent pair, varies. Specimens from the eastern province are more rufous in their markings than those from the Colombo district.

Young. Iris greyish olive; bill dark horn, under mandible yellowish fleshy; legs and feet fleshy reddish.

In first plumage (July) a male in my collection has the feathers of the head, hind neck, back, and wing-coverts very broadly margined with fulvous, the quills edged conspicuously with the same; the centres of the feathers are very black; fore neck and chest tinged with buff, and the flanks strongly coloured with fulvous, as in the adult.

Obs. Blyth described (*loc. cit.*) a second species of *Cisticola* from Ceylon, under the title of *omalura*, alleging that it differed from *C. cursitans* in having "a shorter bill, the whole upper parts much darker, and the tail subeven, except that its outermost feathers are $\frac{1}{4}$ inch shorter than the next. The prevailing hue of the upper parts is dusky black, with much narrower rufescent margins to the feathers than in *C. cursitans*, the rump, however, being unmixed rufescent as in that species, and the neck much tinged with the same." This is simply the plumage of a dark specimen from up-country, in which district Kelaart affirms that he found this supposed species, although Layard discovered it first of all at Galle, and afterwards met with it at Pt. Pedro. Numbers of examples may be met with corresponding to Blyth's *C. omalura*; but it is impossible to separate them from *C. cursitans*, which is as variable in Ceylon as it is throughout the vast range of territory in which it is elsewhere found. Males of the *omalura* type have the inside of the mouth black and the forehead uniform, as in typical *cursitans*; and the females of both have the inside of the mouth fleshy and the head striated, and there is *no difference* in size, which, more than any thing, shows the identity of the two supposed species. Any one examining a large series of this interesting little bird from India, Europe, and Africa must speedily come to the conclusion that it would be very unsafe to take slight differences in plumage into consideration, so variable is it in this respect. The relative

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upper tail-coverts; primaries and secondaries plain brown, the feathers margined with rufous-brown; tail ruddy brown, obsoletely and narrowly barred with brown; the ground-colour of the two outer pairs of rectrices dark brown towards the tips, which are pale; lores, which are brown, surmounted by a whitish streak; ear-covert feathers brown at the tips and whitish at the base; chin, throat, and down the centre of the breast dull white, the sides of the fore neck and the flanks brownish fulvous; under tail-coverts fulvescent brownish, tipped whitish; under wing whitish.

Obs. While examining some drawers of skins in the British Museum, I came on this example of a Timaline bird, labelled "Ceylon, *ex* Cuming." It appears to have been entirely overlooked during a period of more than twenty years; for no bird corresponding to it has ever been noticed as being in the national collection from Ceylon. My friend Mr. Sharpe informs me that there is no doubt about the locality, and therefore the subject of this notice must be added to the already long list of Ceylonese birds. Whether the specimen in question is correctly identified as being the *Schœnicola platyura* of Jerdon it is impossible to say, for he only procured one example, and that was lost, not, however, until after Blyth had seen it, and applied to it the generic appellation of *Schœnicola.* I have carefully compared the skin in the British Museum with the description given by Jerdon of the generic characters and plumage of his bird, and it corresponds in both respects so closely, that I feel almost sure that it is the same species. Jerdon's generic characters are:—"Bill moderate, rather deep, much compressed, slightly curved on the culmen; *a few strong* rictal bristles . . . . Wings moderate, slightly rounded, 4th quill longest, 3rd equal to the 5th; tail moderate, *very broad, soft,*" &c. His description is extremely curt, and runs as follows:—"Above dark olive-brown; the feathers of the tail obsoletely barred; beneath ochreous yellowish, bill horny yellow; irides yellowish brown. Length 5·25 inches; wing $2\frac{1}{2}$; tail 2·5; bill at front 0·4; tarsus 0·9."

It would appear that the Broad-tailed Reed-bird has recently again been procured in Travancore, as in the last number

length of the respective tail-feathers is furthermore not to be depended upon at all. Mr. Hume notices the conspicuous difference in the cold- and hot-weather plumage of this species in India, the head being striated in the former, and uniform in the latter; but this does not appear to be the case in Ceylon, where there is but little change in the seasons. Specimens from Madras, Nepal, and the North-west Himalayas have the lateral tail-feathers variable in length, and nearly all have the head paler than in Ceylonese birds; but the back in some is as dark as in our up-country birds, while in others, notably in one or two from Nepal, it is very pale. The wings vary from 1·9 to 2·2 inches in the males, and the tails from 1·65 to 1·8 inch. A Nicobar example in the national collection, which is, judging from its size, a female, has the wing 1·7; the upper surface is somewhat dark, and the edgings of the feathers rather rufescent.

The West- and South-African representatives of *Cisticola cursitans* do not admit of separation from ours. I append the following among the results arrived at on comparison of a large number of specimens. A West-African example, a presumed female, from the River Volta, has the wing 1·85 inch, tail 1·55, bill to gape 0·5, and is the exact counterpart, as regards plumage, with one of my Galle birds; another, a male from Potchefstroom, measures 2·03 in the wing and 1·8 in the tail, and has the colour of the upper surface pale, like a Hambantota specimen, from which it cannot be separated. Captain Shelley records the wing of Egyptian specimens as 1·9 inch, and Mr. Gurney that of Sicilian examples as 1·86 to 2·0. Turning south-eastwards from India we find that examples of the *Cisticola* from the Malayan archipelago are scarcely separable from ours. A male specimen from Macassar has the wing 1·9, and the edgings of the back-feathers slightly more rufous than most Ceylon birds, but the rump not more so than in some; in the length of the tail, which measures 1·9 inch, it differs from the generality of *C. cursitans* from the continents of Asia, Europe, and Africa; but it is not so sufficiently removed from them to be treated as a distinct species. An example from Flores (*C. fuscicapilla*, Wallace) has the head uniform brown, but not more so than some of my old male specimens in summer plumage. The wing measures 2·0 and the tail 1·6, and I do not think it can be separated from *C. cursitans*.

My space does not permit me to instance further examples; but the evidence here adduced is sufficient to show that specimens throughout the vast range of the species may be found to correspond with others from Ceylon, although races, as a whole, from particular localities may present special characters. I also find that individuals from all parts vary *inter se* in the proportion of the tail-feathers to one another.

Distribution.—This curious little denizen of the grass frequents the whole island of Ceylon from Pt. Pedro to Dondra Head and up to the elevation of Horton Plains. It is, of course, only found in grassy localities, which are alone suited to its habits. It is equally abundant in these spots all over the low country, and is

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of 'Stray Feathers' which I have received I find an account of its (presumed) rediscovery by Mr. Bourdillon on the 18th of April last year. Mr. Hume gives a minute description of the specimen; and it appears from it that the 3rd, 4th, and 5th quills are almost equal, and the 1st 0·9 shorter than the 4th; the tail of *ten* feathers, soft, very broad, and much rounded. Length 5·75 inches; wing 2·5; tail 2·5. The plumage is rich rufescent olive-brown, darker on the crown and tail, which latter is obsoletely rayed; the feathers of the upper surface lax, lower surface brownish olivaceous, with the centre of the abdomen fulvous-white. This bird may or may not be identical with Jerdon's species; it appears, except as regards the length of the tail, to correspond pretty well with the Museum example. Jerdon places his specimen at the end of the Timaliinæ; and I consider the Ceylonese bird to belong to what I have separated as the Drymœcine section of the Timaliidæ, to the members of which its bill, tail, wings, and feet ally it. I accordingly place it here; but as I am uncertain as to whether my identification of it as the *Schœnicola platyura* of Jerdon is correct, I shall assign it a place in this work as a *doubtful* species.

The type of Jerdon's bird having been lost, and no other apparently similar specimen having been subsequently procured or noticed prior to the capture of the Travancore bird and my discovery of the Ceylonese skin in the British Museum, it will be a very difficult matter to determine what *Schœnicola platyura* of Jerdon really is.

Distribution.—The scanty information on the label of this bird affords me no clue as to where Mr. Cuming procured it in Ceylon. It would seem reasonable to suppose that it occurred in the island as a straggler from the coast of India, otherwise subsequent collectors would surely have met with it. There is, perhaps, no spot more favourable to its habits than the great swamp lying between the Negombo Canal and the highroad to that place from Colombo; in this vast morass I met with one species of similar disposition, which has never before been seen in Ceylon, and I would therefore indicate it as a not unlikely locality for the rediscovery of this *rara avis*.

Jerdon's remarks on his meeting with *Schœnicola platyura* are:—"I only once observed this curious bird among

likewise just as plentifully diffused over all the patnas and grass-lands of the Central Province, being quite as numerous at Nuwara Elliya and on the Horton Plains as it is several thousand feet lower down. It is a very well-known bird in the neighbourhood of Colombo, frequenting in large numbers the "Water" grass-fields in the cinnamon-gardens, and those in Borella, Malagaha kanda, and other suburbs of the capital. It is equally common near Galle, Trincomalie, and Jaffna.

It is found in suitable localities throughout the whole of India, extending into Burmah, where Mr. Oates says it is "very common in all paddy-lands during the rains." Further south, in Tenasserim, it does not seem to be so generally distributed as there. The same writer remarks, "I have only occasionally met with this species in the Thatone plains and at Tavoy in grassy lands or rice-fields. It was by no means numerous, and always seen singly or in pairs." In the Malayan archipelago it may be said to exist in the form of a species which cannot well be separated, and specimens of which I have seen sent from Macassar and Flores.

Turning northward we find it, according to Swinhoe, an inhabitant of China, Hainan, and Formosa; and Père David writes that it occurs throughout the east of China, from Hainan to Tientsin, and that he met with it frequently at Shanghai. In Europe it inhabits the countries bordering the Mediterranean, being much more common in some localities than in others. In Corsica Mr. Bygrave Wharton says it is numerous at Biguglia, but observed nowhere else. Dr. Giglioli reports it as common in the neighbourhood of Pisa, frequenting grass- and corn-fields in the spring. It is likewise found in Switzerland. Near Gibraltar it is, according to Col. Irby, resident and very plentiful in winter, and in Southern Spain it is said by Mr. Saunders to be common as far north as lat. 40°. It has been stated to be plentiful in Portugal; but I observe that the Rev. A. C. Smith, in writing to 'The Ibis' of 1868, states that he did not meet with it in that country, though he searched diligently for it in likely places. Crossing over to Africa, we find it noted as the most common of aquatic (?) warblers in Tangier by Mons. Favier; and Captain Shelley, in his excellent book on the Birds of Egypt, says that it is one of the most abundant birds in that country and Nubia: further testimony as to its distribution in this part of the world is afforded by Dr. von Heuglin, in his exhaustive monograph of the Malurinæ of North-eastern Africa (Ibis, 1869, p. 132), who says that it inhabits Arabia, besides being a permanent resident in Egypt and Nubia, and goes southwards to Abyssinia and probably to Senaar. In Western Africa it is common in various localities, having been procured on the River Volta, at Cape Coast, Acra, &c.; on the opposite side of the continent Dr. Kirk records it from Zanzibar. In South Africa it is

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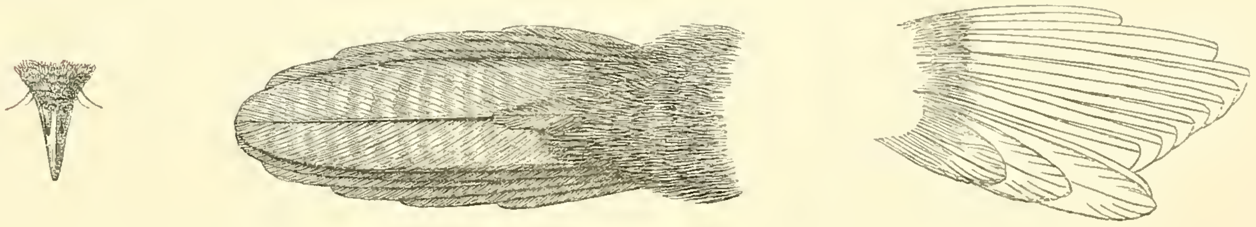
some reeds in swampy ground close to Goodaloor, in the Wynaad, at the foot of the Nilghiris." Mr. Bourdillon's bird, however, was met with under very different circumstances, from which I infer (should it in reality be the same as Jerdon's) that the Broad-tailed Reed-bird is not entirely a denizen of reeds. "It was obtained," says Mr. Hume, "in open grass-land at Colathoorpolay patnas, at an elevation of 3800 feet, in the Assamboo hills, the southernmost section of the Western Ghâts, about three degrees due south of Goodalore, where the lost type and hitherto unique specimen was obtained." Nothing is said of its habits; but Jerdon informs us that his bird "took short flights, and endeavoured to conceal itself among the thick herbage." Its food consisted entirely of small insects.

The accompanying woodcuts represent the bill, tail, and wing of the Ceylonese bird.



plentiful in parts of the Transvaal, Natal, and also in Damaraland, in which region it exists in the form of *C. ayresi* (Natal) and *C. terrestris* (Transvaal), which two races, Mr. Gurney has pointed out, are identical with the *C. schœnicola* of Europe, and consequently with *C. cursitans* of Asia.

Habits.—The Grass-Warbler, as its name implies, frequents both cultivated and wild grass-land of all sorts, paddy-fields, marshes, swamps, meadow-land surrounding inland tanks, waste ground covered with rank herbage, patnas, and all places where the soil will grow sufficient cover for it to thread its way about in. It is essentially terrestrial in its mode of life, and is the most restless little creature imaginable, rising up a hundred times in the day, with its spasmodic jerking flight and singular *chick-chick* note, and then suddenly descending to earth, as if it were simply desirous of exercising its muscular powers or discontented with the haunts that fate had allotted to it. Nothing, perhaps, can be more interesting to the lover of animated nature than, on a lovely morning, to walk through the rich pastures clothing the alluvial deposits round the vast Minery tank, and while the ear is arrested with the sweet song of hundreds of Sky-Larks, to watch the vagaries of these little denizens of the grass, as they flit up and down and send forth their singularly sharp little notes. Its manner of hovering on the wing when it reaches its greatest altitude, which is generally from 50 to 100 feet, is a mere habit, and not done with any view of selecting a place to alight in, as it invariably "jerks" itself down to the ground considerably beyond where it has been poising itself. The large variety, which frequents the patnas of the Nuwara-Elliya plateau and the Horton and other elevated plains, has a habit of alighting on the tops of bushes and rhododendron-trees, and there remaining perched for some time, which I have not observed in the low-country birds. This species is particularly lively in the evenings, just before going to roost, and when it settles on the ground, immediately threads its way through the grass, not by running on the ground, but by adroitly springing from stalk to stalk, and darting here and there wherever an opening in the vegetation presents to it an easy way of escape. When it realights, after being flushed, it will always be found a good number of paces from where it first disappeared, no matter how quickly one follows it up.

There is perhaps no bird of this family concerning which more has been written than the present; and that which has attracted notice, in the case of all naturalists who have observed it, is its peculiar flight, as also its interesting mode of nidification. Of the European race, which, however, appears to frequent sedges and marshy places much more than ours, Col. Irby writes:—"In the spring they go to the cornfields as well, never, however, being found away from water. I do not recollect ever seeing them perch on bush or tree, but always on some plant. Their note and jerky flight somewhat remind one of the Meadow-Pipit; during the nesting season in particular they will fly darting about high over head for several minutes, continually uttering their squeaky single note (whence the name of Tin-Tin), all the time evidently trying to decoy the intruder from their nest." In spite of what I have already said about the European, African, and Asiatic *Cisticolæ* being identical, I would here remark that the difference in the note of the European and the Indian bird, and likewise the extraordinary variety in the eggs of the former (allusion to which will presently be made), while those of the latter are all of the one type, is somewhat remarkable, and might well be considered sufficient to establish grounds for a slight separation of the two races. As far as external characteristics go, I do not perceive that the African bird can be separated from the Indian, as has already been stated in this article; and competent ornithologists affirm that there is no difference in the birds on both sides of the Mediterranean. The diet of the species in Ceylon consists of many sorts of small insects and caterpillars; and Brehm says that "the indigestible parts of the food, which consists of small beetles (*Diptera*), caterpillars, and little snails, are thrown up in pellets." It is with reference to observations made in Africa that this statement is made; but I have no knowledge of the same thing having been noticed in India. Jerdon remarks that "during the breeding-season the male bird may be seen seated on a tall blade of grass, pouring forth a feeble little song."

Nidification.—This Warbler apparently has two broods in the year, nesting for its first in May, June, and July, and for the second in November and December. Its style of architecture is suited to the locality in which it builds; but at all times it constructs a very beautiful little nest. It is, when built in tall grass or paddy, usually situated about 2 feet from the ground; a framework is first made by passing cotton or other such material round and *through* several stalks or stiff blades of grass; when a tolerably secure wall is thus

obtained, several blades belonging to the stalks round which the framework is passed are bent down and interlaced to form a foundation, on which, and inside the cotton network, a neat little nest of fine strips torn off from the blade is built; this is, as a rule, beautifully lined with cotton or other downy substance, mixed with the saliva of the bird and having the appearance and texture of thick felt. The average dimensions of the egg-cavity are 2 inches in depth by $1\frac{1}{4}$ in diameter; the network or frame takes two or three days to construct, and the entire nest is finished in about six days. When nesting in short, tussocky grass, such as is found on the "Plains" of the main range, the Grass-Warbler builds in the centre of a thick tuft close to the ground, the blades being drawn round the nest and brought into a point above it, in which the entrance is placed, and the whole is so well concealed, that, unless the bird be roused from it, it would invariably elude the best search. The eggs are usually three, but sometimes four, in number, short ovals in shape, and without much variation in colour; the ground is white or very pale greenish white, spotted and blotched, generally in an open zone round the large end, with brownish red and reddish grey. Dimensions, on the average, 0·6 to 0·63 inch in length by 0·48 to 0·51 in breadth. The period of incubation lasts from nine to ten days, the bird sitting for the most part only at nights. I had ample opportunity of ascertaining this fact from two years' observation of this and other birds breeding in the "Guinea-grass" field attached to my bungalow on the Galle face, Colombo.

The nesting-season in India lasts during the rainy months—April to October. Mr. Hume, writing, in 'Nests and Eggs,' of its nidification there, says that it selects a patch of dense fine-stemmed grass, from 18 inches to 2 feet in height, and, as a rule, standing in a moist place; in this, at the height of from 6 to 8 inches from the ground, it builds. Corresponding with my own observations in Ceylon, he states that the "sides are formed by the blades and stems of the grass *in situ*, closely packed and caught together with cobwebs and very fine silky vegetable fibre;" the interior is also stated to be closely felted with silky down, in Upper India usually that of the Mudar (*Calotropis hamiltoni*). In India, as in Ceylon, the eggs appear to be all of one type, the ground being white, spotted, most densely towards the large end, with, as a rule, excessively minute red, reddish-purple, and pale purple specks, thus resembling, though smaller, more glossy, and far less densely speckled, the eggs of the Rufous-fronted Wren-Warbler. The average dimensions of a large number are recorded as 0·58 in length by 0·46 in breadth. Dr. Von Heuglin found it nesting in Africa in date-palm groves and low thorn hedges, about 2 or 3 feet from the ground. He likens the nest to that of the Reed-Warbler, and describes it as interwoven with leaf-sheaths, thorns, twigs, and even grass-stalks, and composed of fine dry grass and rootlets, the interior being "carefully lined with wool, hair, and fibres." These nests appear to be somewhat abnormal, as it is unusual for this species to build anywhere except in grass, standing corn, sedges, &c.

Concerning its nidification in Egypt, Capt. Shelley writes (*loc. cit.*):—"It breeds in March, forming a charming little deep purse-shaped nest, open at the top, which I have found in clover, corn, and sedge, at a height of from a few inches to a foot from the ground. The nest is constructed of dried grass and cotton, and often thickly lined with soft downy seeds of the reed or thistle, and is firmly secured by the interweaving of the surrounding herbage, which assists to hide it; in general appearance it looks very like the cocoon of a large caterpillar." The eggs are said to vary to a great extent in Europe. Dr. Bree figures three varieties, one pink, another bluish white, and the third a dark bluish green, all being *spotless*.

PASSERES.

Fam. SYLVIIDÆ.

Bill moderately slender and straight; the culmen acute; the tip notched; rictal bristles short. Wings pointed; the 1st quill much reduced. Tail of 12 feathers, shorter than or not exceeding the wing. Tarsus scaled, longer than the middle toe.

Of small size, with a double moult, and of unspotted young plumage.

Genus SYLVIA.

Bill small, rather straight; the culmen gently curved from the base. Nostrils oval; gape beset with small bristles. Wings long; the 3rd, 4th, and 5th quills equal and longest, the 1st not much exceeding the primary-coverts. Tail rounded at the tip. Tarsus rather short, shielded in front with well-developed scales; toes stout and strongly scaled.

SYLVIA AFFINIS.

(THE LARGER INDIAN WHITETHROAT.)

Sylvia affinis, Blyth, Cat. B. Mus. A. S. B. spec. C (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 267; Layard & Kelaart, Prodromus, Cat. p. 57 (1853); Jerdon, B. of Ind. ii. p. 209 (1863); Holdsworth, P. Z. S. 1872, p. 457.

Sterparola curruca (Lath.), Hume, Nests and Eggs, ii. p. 373 (1874).

Sylvia althæa, Hume, Str. Feath. 1878, vol. vii. p. 60.

The Allied Grey Warbler, Jerdon. *Nella kumpa-jitta*, Telugu.

Adult male (Aripu, Dec. 1869). Length (from skin) 5·6 inches; wing 2·8; tail 2·8; tarsus 0·7; middle toe 0·5, its claw (straight) 0·15; bill to gape 0·57.

2nd quill intermediate in length between the 6th and 7th.

"Irides pale yellow; bill, base slate, tip dusky; feet dark leaden" (*Holdsworth*).

Crown and nape *dull* bluish ashy, changing into the *subdued* earthy brown of the hind neck, back, and scapulars; the upper tail-coverts more ashy than the back; lesser wing-coverts ashy at the margins of the feathers, the centres being concolorous with the back; wings brown, the edges of the primaries and secondaries pale fulvous brownish, the tertials more conspicuously margined than the outer secondaries; tail darker brown than the wings, the margins of the feathers albescent, the outer web and terminal portion of the inner web of the outer feather and the tips of the two next dull white; lores and ear-coverts dark brown, contrasting with the ashy hue above and below the ears on the side of the neck; lower portion of orbital fringe white; chin and throat pure white; chest and under surface whitish, faintly tinged with reddish ashy, mostly on the sides of the chest and the under tail-coverts; flanks slightly shaded with greyish; edge of the wing white; under wing-coverts tinged with reddish ashy.

Obs. The above is a description of an example procured by Mr. Holdsworth at Aripu, and the only one, I believe, now extant from Ceylon, unless Specimen C of Blyth's Catalogue is still in a state of preservation in the Calcutta Museum. It appears to belong to the larger race lately distinguished by Mr. Hume as *S. althæa*; it, however, has the head more ashy than I am led to suppose is the case in *S. althæa*; and as I think Mr. Hume will require a larger series before he can safely found his new subspecies, I will keep the Ceylonese bird as *S. affinis*, the title

by which the Indian Whitethroat has hitherto been known. *S. althæa* is characterized by its large size, the wings of five examples in Mr. Hume's museum varying from 2·7 to 2·8 inches, and further by having the upper surface darkish grey, slightly tinged with brown on the back. The 2nd quill of one of these examples nearly equals the 8th, and in three others is intermediate between the 6th and 7th, as in the Ceylonese example. The ordinary form of Indian Whitethroat, *S. affinis*, from which Mr. Hume separates the last named on account of the characters here noticed, has a smaller wing; in 93 specimens it varies from 2·4 to 2·71 inches, and several that I have examined from Futteghur and Cawnpore measure 2·5 to 2·6 inches. The 2nd primary, as a rule. equals the 6th. All these examples have, according to Mr. Hume (and so have others which I have examined), the crown brownish grey and the mantle earth-brown. An example in Mr. Seebohm's collection, procured at Yenesaisk, is almost as "earthy brown" as the Cawnpore birds above mentioned, and its wing measures 2·5 inches. The third and smallest race, which appears to be confined to "the extreme western portions of the continent," has the wing varying from 2·3 to 2·45 inches, and has the "crown pale bluish grey, and the mantle pale sandy brown" (*Hume*).

These Indian Whitethroats differ from their closely allied relative of Europe, *S. curruca*, in the proportion of the primaries to one another. The 2nd quill in the latter is considerably longer than in the Indian birds, it being generally *equal to the 5th, or only very little shorter than it.* The bill in the European bird is usually shorter, and the ear-coverts are not so dark, while the upper surface is more cinereous or less brown than in *S. affinis.* The coloration of the upper surface varies, however, scarcely any two specimens being *precisely* alike. A Heligoland specimen in Mr. Seebohm's collection is almost a counterpart of Mr. Holdsworth's, being only slightly paler on the head. A specimen from Christiania is nearly as sandy-coloured as any Indian example of *affinis.* Two specimens from Asia Minor, which I have examined, are ashy on the back, being almost devoid of any earthy tint at all; they belong to the European species, having the 2nd primary longer than Indian examples.

Mr. Seebohm, in his notice of the Whitethroats he procured in Siberia, 'Ibis,' 1879, p. 8, hesitates to allow the Indian bird to be a good species, and instances one specimen from India which has the 2nd quill as long as in the European species. He will, however, no doubt reinstate it in his forthcoming volume of the Catalogue, now that the results of Mr. Hume's researches have been published. If the proportion of the primaries is allowed to hold good in the separation of certain *Phylloscopi* and *Acrocephali*, members of this family, it must be a matter of equal importance in the present case.

Distribution.—This Whitethroat is evidently a very rare cool-season migrant to Ceylon. Whether it is actually commoner than is supposed, and escapes observation owing to the habits of concealment which it no doubt affects in the non-breeding season, I am unable to say; but certain it is that it has only, as yet, come under the notice of two observers. Layard, its first discoverer, writes as follows concerning it:—"I noticed a few of this species at Ambegamoa in the year 1848, but I never afterwards met with it." He informs me, *in epist.*, that, as far as he can recollect, the month of March was the time of his meeting with them. Recently it was again observed by Mr. Holdsworth, who procured the example noticed in this article at Aripu in December 1868. The two localities in question are far apart; and the facts of the case prove that it wanders over the island when it does visit it, and there is no saying where it may not be met with in future. I always kept a look out for it in my wanderings in the north, but never once saw it that I am aware of.

The larger race, to which I have attached Mr. Holdsworth's specimen, has been found in the western parts of peninsular and continental India—Mr. Hume's specimens being recorded from Ahmednuggur, Deesa, Jhansie, Bhawulpur, and Ramoo Cashmeer. Jerdon, in speaking of the distribution of the Indian Whitethroat generally, says he "found it in the Carnatic at Jaulnah and other parts of the Deccan, and also at Mhow;" and these observations may possibly refer to the larger race as well as the smaller, *S. affinis.* The majority of Mr. Hume's specimens of the latter appear to come from the central portion of continental India, between Sambhur and Cawnpore.

Habits.—Like the European Whitethroat, this species frequents low bushes, grassy patches of land, gardens, and groves, and is very active in its movements, flitting from place to place, and threading its way among the thick masses of vegetation in which it takes up its abode. Jerdon remarks that, in addition to being insectivorous in its diet, it feeds much on flower-buds. Blyth writes of its habits:—"I observed many of them frequenting the Baubul (*Mimosa*) trees, and, as in England, keeping chiefly to the trees and not to low bush-coverts, as is the habit of *S. cinerea*" (the Greater Whitethroat). Mr. Brooks writes that its song resembles that of the European species, being full, loud, and sweet, and that the male usually sings near the nest.

Nidification.—This species breeds in Cashmere in May, building a nest, according to Mr. Brooks, similar in size and structure to the European Lesser Whitethroat, "formed of grasses, roots, and fine fibres, and scantily lined with a few black horsehairs." The nests are "slight and thinly formed, very neat but strong," and are decorated on the outside with bits of spiders' webs. At the time this was written, Mr. Hume did not accept the Indian birds as distinct from the European; but having since altered his opinion, based on the characteristic wing-formula of the two species, I shall be correct in giving his description of the eggs as applying to the Indian bird, though perhaps not to the larger race with which I am principally dealing. He characterizes them as somewhat broad ovals typically, a good deal pointed towards the lesser end; the ground-colour is white, marked with small spots, blotches, and specks of pale yellowish brown, more or less intermingled with spots of dull inky purple; in some the markings are confined to a zone, in others scattered over the surface of the egg. The average dimensions of sixteen eggs are 0·66 by 0·5 inch.

Genus ACROCEPHALUS.

Bill lengthened, straight; culmen acute, the tip slightly bent down and plainly notched. Nostrils basal and oval; rictal bristles well developed. Wings pointed; the 1st quill minute, the 3rd and 4th the longest; the 2nd variable, but never much less than the 3rd. Tail moderate and rounded at the tip. Legs and feet strong; the tarsus protected by broad scutes in front, and longer than the middle toe; lateral toes short; hind toe and claw very long.

ACROCEPHALUS STENTORIUS.

(THE CLAMOROUS REED-WARBLER.)

Curruca stentorea, Hemp. & Ehr. Symb. Physicæ, Aves, fol. *bb* (1828); Blanford, Ibis, 1874, p. 79.

Agrobates brunnescens, Jerdon, Madr. Journ. 1839, x. p. 269.

Acrocephalus brunnescens (Jerd.), Blyth, Cat. B. Mus. A. S. B. p. 181 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 331 (1854); Jerdon, B. of Ind. ii. p. 154 (1863); Hume, Lahore to Yarkand, p. 214, pl. 16 (1873); Legge, Str. Feath. 1873, p. 488 (first record from Ceylon).

Calamoherpe brunnescens (Jerd.), Blyth, J. A. S. B. 1846, xv. p. 288.

Calamodyta brunnescens (Jerd.), Hume, Str. Feath. 1873, p. 190; Adam, *t. c.* p. 381; Legge, ibid. 1875, p. 369.

Acrocephalus stentorius (H. & E.), Allen, Ibis, 1864, p. 97, pl. 1; Shelley, Ibis, 1871, p. 133; id. B. of Egypt, p. 95 (1872).

Calamodyta stentoria (H. & E.), Hume, Nests and Eggs, ii. p. 326 (1874).

Calamodyta meridionalis, Legge, Str. Feath. 1875, p. 369.

The Clamorous Sedge-Warbler, Shelley; *The Greater Indian Reed-Warbler. Bora-jitta*, Telugu.

Adult male. Length 7·5 to 7·8 inches; wing 3·3 to 3·4; tail 3·2; tarsus 1·05 to 1·1; middle toe and claw 0·9 to 1·0; bill to gape 1·05.

Adult female. Length 7·5 inches; wing 3·1; tarsus 1·0; middle toe and claw 0·85 to 0·95; bill as long as in the male.

Iris brownish yellow; bill, upper mandible dark brown, lower fleshy at base, with dusky tip; gape and inside of mouth red; legs plumbeous grey or greenish plumbeous; feet olivaceous, claws brownish.

Above shining olivaceous brown, in some specimens slightly darker on the forehead; wings and tail brown, margined with the hue of the back; from the nostril over the eye a pale streak, beneath this the lores are dark brown: orbital fringe fulvous-grey, dark at its posterior corner; chin and throat white, with a fulvous-grey wash over the chest and flanks, darkening on the lower parts above the thighs and paling again to white on the centre of the breast and abdomen; under tail-coverts whitish; under wing and its edge fulvous; between the flanks and abdomen the grey hue is tinged with tawny. In non-breeding plumage the underparts are more fulvous than after the spring moult.

During the breeding-season, in July and August, the plumage becomes much abraded, causing the feathers of the upper surface to have pale edgings, and exposing on the fore neck the dark portions of the shafts of the feathers, which are quite concealed in a newly-plumaged bird, the effect of this being to produce a number of pale brown striæ. I observe the same feature in examples sent me by Mr. Hume from North India.

Obs. I was under the impression, when writing of this species in 1875, that it merited separation from the Indian form, on account of the presence of striæ on the chest, and the absence, in some specimens from Ceylon, of the rusty hue on the upper surface, which is a character of the latter species. Mr. Hume, however, pointed out that these characters were seasonal; and I have since examined Cashmere specimens shot in July with these throat-marks and find they show on the surface merely, on account of abrasion, the dark shaft-stripe, as above remarked, existing more or less always, but being concealed by the tips of the feathers in birds in new plumage. Three examples from the locality in question have very large bills, varying from 1·1 to 1·2 inch in length from the gape; but one from Calcutta, perhaps bred in the lowlands, is the counterpart of my Ceylonese birds, both as regards plumage and length of bill (1·05 inch).

This Warbler and *A. orientalis*, which inhabits China, Japan, and some of the Malay islands (Lombok, Morty, Batchian, and perhaps others), are very closely allied Asiatic representatives of the large Reed-Warbler of Europe, *A. arundinaceus*, from which they differ in their smaller size and the proportion of the quills to one another. The European bird has a more pointed wing than its Asiatic relatives and is larger. The following is a diagnosis of the characters of the three races :—

A. arundinaceus. Larger: wing (5 examples measured) 3·7 to 3·9 inches; 1st *long* primary longer than the 3rd.

A. orientalis. Smaller: wing (19 examples measured) 3·05 to 3·5 inches; 2nd *long* primary slightly shorter than, or equal to, the 3rd.

A. stentorius. Intermediate in size in its average measurements: wing (6 Ceylonese and 6 Indian examples measured) 3·1 to 3·55 inches; 2nd *long* primary shorter than the 4th.

A Labuan specimen is intermediate between the two latter: it has the 2nd long primary equal to the 4th; wing 3·4 inches, bill to gape 0·98.

Mr. Seebohm recognizes the *Acrocephalus longirostris* of Gould and the *Sylvia syrinx* of Kittlitz as subspecies of *A. stentorius*, depending for their rank chiefly on their peculiar distribution and smaller size. The first-named bird, which winters in Lombok and breeds in Western Australia, has a proportionately longer bill than *A. stentorius*, and measures in the wing 2·8 to 3·1 inches; the 2nd primary is intermediate in length between the 5th and the 6th. The second, *Acrocephalus syrinx*, is confined to the island of Ponape in the Caroline group. It has a proportionately shorter tail than the preceding species, and measures in the wing 2·9 inches; the 2nd primary is intermediate between the 6th and the 8th.

The whole of these Austral-Asiatic Reed-Warblers appear to be merely local races of our European species.

Distribution.—It is only of late years that this fine Warbler has been known to inhabit Ceylon. It was first discovered by myself in the Jaffna-Fort ditch, where there is a bed of reeds suitable as a refuge for such a lurking species as it is. It is also an inhabitant of the adjacent lotus-ponds, and occurs in similar spots throughout the island. I found it breeding in July in the Tamara-Kulam near Trincomalie, which, in the dry season, is a vast bed of gigantic rushes; at the celebrated Pollanarua tank it was abundant during the same month, and in the extreme south I procured it near Hambantota likewise in the hot season. Mr. Parker met with it near Puttalam, and afterwards, in the month of July, came on "dozens in a small tank full of reeds at Ambanpola on the Anaradjapura road a few miles beyond Bulalli." There is therefore abundant proof that it is a tolerably plentiful resident in the island, a circumstance somewhat remarkable when it is considered that the bird is a visitor to the plains of India. On strict search being made for it, it will doubtless be found in many places, similar to those mentioned, in the wild dry districts of the country. From the damp portion comprised of the Western Province and south-western district it appears to be absent; for I examined the lofty reed-beds (a most likely place) which line the old Dutch canal and its branches which intersect the Mutturajawella swamp between Colombo and Negombo, and found no trace whatever of it, which, I think, is strong testimony that it does not inhabit any part of the south-west.

Dr. Jerdon writes that it is found in most parts of India during the cold weather, being only a winter visitant. Mr. Hume likewise, in 'Lahore to Yarkand,' expresses the same opinion; but I observe that Mr. Adam found it at the Sambhur Lake in the middle of May; and though the eggs in the ovary were very minute, yet it was close to its breeding-time, Mr. Brooks having found its young in Kashmir on the 10th of June; it is therefore probable that some examples may remain behind to breed. On the other hand, Captain Butler gives the date of its departure from the district with which he deals as the 8th of April. Dr. Fairbank merely remarks, with regard to the Deccan, that it is found among rushes, giving no details of its arrival or departure; but Dr. Jerdon specifies the Carnatic as a region to which it is a visitant; therefore we may conclude that this writer's statement, backed as it is by the experience of Mr. Hume, will be found to hold good for the entire peninsula, and that this Warbler, while migratory from Northern India to the Southern parts of the empire, is a resident in Ceylon! I believe, however, that further investigation is still necessary, as, owing to its habits, it may have been overlooked; and I commend the matter as one of great interest to my Indian readers.

Mr. Blanford records it from Persia, and says that it was rather scarce at Bampur in Beluchistan in April, but abounded in June near the lake of Shiraz; in these localities he considers that it probably breeds, leaving

the highlands in winter; it probably extends into Northern Persia, as Mr. Blanford notices that De Filippi gives an account (Viag. in Persia, p. 162) of a bird which he saw resembling this species.

In Northern Africa it is an inhabitant of Egypt and Nubia. Mr. Allen, who gives an account of its breeding, found it in a lake near Damietta, and speaks of it as being very rare; subsequently Mr. E. C. Taylor and Captain Shelley met with it in the same place. The latter author considers that it is resident in Egypt, as he noticed a specimen as early as the 7th March in the Fayoom.

Habits.—In Ceylon, as in other countries inhabited by it, this Warbler is only found in high reeds or lofty rush-beds surrounding water, in the thickest parts of which vegetation it skulks, rarely showing itself except during the breeding-season, when it becomes very noisy and restless, constantly flying up to the tops of the tallest reed-stalks and there giving out its harsh warble. This commences with somewhat measured notes and then breaks forth into quick and jerky variations. Its usual voice consists in nothing but a monosyllabic "*chit*," varied sometimes by a "*churr*" sound. There are few spots in any part of the island suitable to its habits, as Ceylon is not at all prolific in reeds or any tall rushes, and to those which furnish it with a good retreat it clings with an instinctive tenacity which is something quite remarkable. The tank which I have mentioned above as being overgrown with enormous rushes in the dry season, abounded with these Warblers in the month of June; shortly afterwards it was burnt by herdsmen for feed for their cattle, leaving nothing but a few solitary clumps of reeds standing amidst the blackened waste. When I visited it no sign of a Warbler was anywhere to be seen. Blue Coots and Waterhens were moping about at the edge of the only remaining sheet of water, and a few of the handsome Water-Pheasants (*Hydrophasianus chirurgus*) "scudded" along the lotus-leaves as I approached. None of these I wanted, and was about to turn my back upon the wild scene when a flock of Weaver-birds (*Ploceus*) flew across the open and settled on one of the reed-clumps, when immediately out sallied one of my looked-for Warblers and chirped defiance at the strangers, which was the signal for further notes almost in every little oasis of vegetation. On my trying to drive them out of their strongholds they retreated to the base of the reeds, and no amount of shouting or stone-throwing, and in some cases of stamping even on the rushes, sufficed to flush them. It was only by setting fire to the almost impenetrable cover that I succeeded in getting a shot. At Topare tank they were constantly on the wing and very noisy, and I had ample opportunity of observing their animated movements, although I could not get a shot at them. I found the food of the specimens I procured at various times to consist of small flies and minute insects.

Of its habits in India Jerdon writes:—"It frequents high grain-fields, to the stalks of which it clings, and on being observed conceals itself among them. At Jaulnah I have seen it in my garden, hunting about various low shrubs, peas, and beans, &c., among which, on being observed, it immediately withdrew, most carefully hiding itself and being with difficulty driven from its place of refuge. I occasionally heard it utter a harsh clucking note. I found its food to consist of small grasshoppers and ants."

Mr. S. S. Allen (*l. c.*) thus describes meeting with it in Egypt:—"Shortly after entering the labyrinth of tall reeds which covers the greater part of the lake, and is intersected by narrow lanes of water, along which the flat-bottomed boat is poled, a curious harsh grating note burst out suddenly, with almost startling abruptness, from the reeds a little distance ahead, and was answered by others in two or three different directions. On questioning the Arabs who accompanied me, they replied that it was 'only a little bird,' which I could scarcely believe at first; but on watching the spot closely for a short time, we presently saw a little sober-coloured bird, rather larger than a Nightingale, hopping in and out among the reeds, every now and then making the air ring with his noisy song."

Nidification.—This species breeds in Ceylon during June and July. Its nest was procured by me in the former month at the Tamara-Kulam, and was a very interesting structure, built into the fork of one of the tall seed-stalks of the rush growing there; the walls rested exteriorly against three of the branches of the fork, but were worked round some of the stems of the flower itself which sprung from the base of the fork. It was composed of various fine grasses, with a few rush-blades among them, and was lined with the fine stalks of the flower divested, by the bird I conclude, of the seed-matter growing on them. In form it was a tolerably deep cup, well shaped, measuring $2\frac{1}{2}$ inches in internal diameter by 2 in depth. The single

egg which it contained at the time of my finding it was a broad oval in shape, pale green, boldly blotched with blackish over spots of olive and olivaceous brown, mingled with linear markings of the same, under which there were small clouds and blotches of bluish grey. The black markings were longitudinal and thickest at the obtuse end. It measured 0·89 by 0·67 inch.

In India it has as yet only been found breeding in Cashmere, and there only (at the time Mr. Hume's 'Nests and Eggs of Indian Birds' was published) by Captain Cock and Mr. Brooks. It breeds in May and June; and the nest is described variously as an "inverted and truncated cone," "a deep cup," and "a largish nest of a deep cup form," composed of coarse water-grass or dry sedge, woven round the reeds which support it about 2 feet above the water. Mr. Hume describes two types of eggs—the one stippled minutely with small specks, over which are scattered bold and well-marked spots of greyish black, inky purple, olive-brown, yellowish olive, and reddish umber-brown; in the other the stippling is almost wanting, and the markings are smaller and less well defined. The average size of nine eggs was 0·89 by 0·61 inch.

ACROCEPHALUS DUMETORUM.

(BLYTH'S REED-WARBLER.)

Acrocephalus dumetorum, Blyth, J. A. S. B. 1849, xviii. p. 815; id. Cat. B. Mus. A. S. B. App. p. 326; Kelaart, Prodromus, Cat. p. 120 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 263; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 332 (1854); Jerdon, B. of Ind. ii. p. 155 (1863); Holdsworth, P. Z. S. 1872, p. 455; Adam, Str. Feath. 1873, p. 381; Brooks, ibid. 1875, p. 241; Anderson, *t. c.* p. 351; Butler, *t. c.* p. 479; Dresser (Severtzoff's Fauna of Turkestan), Ibis, 1876, p. 84.

Calamodyta dumetorum (Bl.), Hume, Nests & Eggs, ii. p. 327 (1874); Ball, Str. Feath. 1874, p. 414.

The Lesser Reed-Warbler, Jerdon; *The Bush-Warbler* of some. *Tikra*, Bengal.; *Podena*, Hind.; *Tik-tikki*, Mussulmen.

Adult male and female. Length 5·4 to 5·6 inches; wing 2·35 to 2·55; tail 2·1; tarsus 0·8 to 0·9; middle toe and claw 0·6 to 0·68; bill to gape 0·7 to 0·72; 2nd quill equal to the 6th.

Iris clear olive; bill dusky brown or dark brown above, lower mandible light fleshy, tip slightly dusky; legs and feet plumbeous or bluish grey, claws dusky bluish.

Above uniform brownish olive, paling slightly towards the upper tail-coverts; in some specimens the upper surface is of a darker hue than in others and the forehead deeper in colour; wings and tail hair-brown, edged with the hue of the back; orbital fringe fulvous-grey; lores dusky, surmounted by a pale supercilium; cheeks mottled brownish; beneath white, more or less shaded with pale brownish on the sides of the chest and flanks, this colour blending into the white with a fulvous tinge; the hue of the sides of the neck likewise blends softly into the white of the throat.

Young. Some specimens which are obtainable in Ceylon during the season of their visit have the tips of the secondaries and tertials pale; these are probably immature birds.

Obs. Ceylonese specimens of this bird were stated to possess a greenish shade; they, however, migrate to us from the peninsula of India, and it is difficult to see how they could differ from their fellows on the mainland. I find that the hue of the upper surface varies in specimens from India and elsewhere; and in comparing six from Ceylon with the same number from India and Siberia, I observe that the former as a whole are not more olivaceous on the back than the latter. The wing in nine examples varies from 2·3 to 2·5 inches, one specimen from Etawah alone exceeding 2·4; *A. dumetorum* is the Indian representative of the Reed-Warbler of Europe (*A. strepérus*), which is a summer visitor to England. It is closely allied to this latter, differing from it in the proportion of the longer primaries to one another, which give it a more rounded wing; likewise in its deeper bill, the more olivaceous tint of the upper surface, and its somewhat smaller size. Various examples of *A. streperus* which I have examined vary in the wing from 2·45 to 2·5 inches in males, and from 2·4 to 2·5 in females. The 2nd quill or 1st long primary is equal to the 4th.

The following comparison of the differentiating characters of these two Warblers will show at a glance in what respect they differ:—

A. streperus. Larger, browner on the lower back; bill slender; 2nd quill (1st long primary) equal or slightly shorter than the 4th.

A. dumetorum. Smaller, back and rump more olivaceous than in *A. streperus*, bill stouter; 2nd quill equal to the 6th.

The *Acrocephalus montanus* of Jerdon, B. of Ind. p. 155, and which he compares with *A. dumetorum*, is a small Babbler (*Alcippe*), about the size of *A. nigrifrons*. There is, at least, a specimen of it, collected by Mr. Wallace, in the British Museum, and provisionally labelled *A. montanus*. It is olivaceous brown above and pale beneath, tinged with fulvous.

Distribution.—The Lesser Reed-Warbler (or Bush-Warbler, as it would be more appropriately called, as

far as Ceylon is concerned) is a cool-season visitant to the island, arriving usually in October, but some seasons not appearing about Colombo until the beginning of November. It is found throughout the entire low country, being very numerous in the north and in all the west of the island. It inhabits the Jaffna peninsula and adjacent islands, as well as Manaar, in great numbers, and about Colombo it is very common. In the Central Province it ranges up to 4500 feet, at which height I have seen it at Catton, in Haputale, inhabiting there patnas and coffee-estates; above 2500 feet it is not very frequent in any part but Uva; but lower than this, in Dumbara and portions of the western districts of similar altitude to that valley, it is almost as common as in the low country. Its time of departure varies according to season; during some years I have seen it at Colombo as late as the 15th of April; but I should say all leave the island, at the latest, before the 25th of that month. Mr. Hume remarks that they leave the plains of India after the end of March; but I conclude that they remain somewhat later than this in some parts; in fact Captain Butler says it does not quit the Mt. Aboo and Deesa districts until the middle of April.

In the cool season (namely, from September until April) it is found throughout India, more or less, inhabiting such districts as are suitable to its habits. Jerdon writes that it is found in the Nilghiris and on the west coast, and also in the Carnatic, Central India, and Bengal; it likewise, he says, extends into Assam; but it does not migrate southwards into Burmah, if we may take the experience of naturalists who have lately collected there. It breeds in the Himalayas and Cashmere, whither it retires after its season's residence in more southerly latitudes, and inhabits these hills to an altitude of 7000 feet. In some parts of the north-west it is plentiful, as in Kattiawar; in others it is rare, as in the Sambhur-lake district and in Sindh, from which latter place it has only lately been recorded by Mr. Blanford. In Chota Nagpur it is local, for Mr. Ball has only obtained it in Sirguja. About Calcutta he speaks of it as common, although Blyth wrote, many years ago, that it never was to be seen about the marshy salt lakes of that neighbourhood, among which the last species is common. Severtzoff found it in Turkestan; but it does not seem to range to the eastward of that region, as Prjevalsky did not meet with it in Thibet or Mongolia.

Habits.—Blyth's Warbler frequents low and thick bushes, detached thickets, and bushy trees, even in the most public places, but never betakes itself (in Ceylon) to reeds or sedgy spots, although I have noticed it sometimes in clumps of bamboos overhanging streams. When it first arrives it takes up its quarters in some thickly-foliaged tree or dense bush, and there remains throughout most of the season; and so regular is it in its habits, that I have perceived it for weeks from my windows, sallying out of the same tree to another close by, about the same hour every morning. It feeds on insects, which it procures among the branches and leaves of trees, attentively searching for them, and leisurely hopping about from twig to twig, now and then jerking out a sudden "*chik*," reminding one of the note of the "Whitethroat" in our hedges at home. It remains almost perpetually concealed from view, showing itself, when it does emerge from its stronghold, for a very short time. It commences to warble slightly in March; and on one or two occasions I have seen it perched on the top of a bushy Suriah-tree in the Fort at Colombo, endeavouring to utter its love-notes, perhaps preparatory to winging its way, in a few days, to far more temperate climes, where they develop into a fine and vigorous song.

In India it seems to avoid reeds, in the same manner as in Ceylon. Blyth writes that it comes a good deal into gardens, frequenting pea-rows and the like. Mr. Adam noticed it hunting for insects among reeds, and says that after each hunt it perched well up on a reed and uttered its peculiar loud call.

Nidification.—This species breeds, as far as is known, not further south than the Himalayas. There, according to Indian observers, it nests along the banks of streams or in thick bushes near water, building, as noticed by Captain Hutton, a globular nest of coarse dry grasses, lined with finer grass. The eggs are described by Mr. Hume as "broad ovals, smooth and compact in texture, with little or no gloss . . . . .; they are pure white, very thinly speckled with reddish and yellowish brown, the markings being most numerous towards the larger end." Dimensions 0·62 by 0·5 inch.

Since the publication of Mr. Hume's 'Nests and Eggs' in 1873, the late Mr. A. Anderson found this Warbler breeding in Upper Kumaon at elevations from 3000 to 6000 feet; his experience corroborates that of

Captain Hutton as to its building in a bush; he found a nest in the middle of a small rose-bush, about 2 feet from the ground; it was "elliptical in shape, and about the size of an Ostrich's egg, made of the largest and coarsest blades of a kind of dry grass, the egg-cavity being lined with grass-bents of a finer quality." The eggs in the nest were four in number, "pure white and beautifully glossed, and well covered with rufous or reddish-brown spots, most numerous at the obtuse end."

Subgenus LOCUSTELLA.

Similar in *external* structure to the last, but possessing longer under tail-coverts, minute instead of well developed bristles, and a striated upper plumage.

LOCUSTELLA CERTHIOLA.

(PALLAS'S WARBLER.)

Motacilla certhiola, Pall. Zoogr. Rosso-As. i. p. 509 (1831).
Locustella rubescens, Blyth, J. A. S. B. 1845, xiv. p. 582.
Locustella certhiola (Pall.), Bp. Consp. Gen. Av. i. p. 280 (1850); David & Oustalet, Ois. de la Chine, p. 248 (1877); Prjevalsky, B. of Mongolia, Rowley's Orn. Misc. vol. ii. p. 170 (1877); Legge, Ibis, 1878, p. 204 (first record from Ceylon); Dresser, B. of Europe, pt. 68 (May 1878); Seebohm, Ibis, 1879, p. 13.
The Lesser Reed-Warbler, Jerdon; *Pallas's Grasshopper-Warbler*.
Camishevka-priatlivaya, Russian.

Adult male (Ceylon). Length 5·6 inches; wing 2·5; tail 2·1; tarsus 0·9; middle toe and claw 0·87; hind claw 0·34; bill to gape 0·67. Expanse 7·5. Weight ½ oz.

Female (Ceylon). Length 5·3 inches; wing 2·35; tail 1·9; bill to gape 0·65.

Iris reddish brown; bill, upper mandible blackish brown, lower fleshy white at base, the tip dusky; legs and feet fleshy brown, inner side of tarsus paler.

Winter plumage (Ceylon). Above rusty olivaceous brown; the feathers of the centre of the back and interscapular region with very broad black centres, narrowing on the hind neck; the crown and occiput almost entirely dull brown-black, the forehead and edges only of the rest of the feathers being olive-brown; wings dark brown, the coverts and quills edged with the hue of the back, and the 2nd primary with a pale margin; upper tail-coverts with central terminal black dashes; tail olive-brown, the terminal portions of the feathers with central blackish "drops," and the tips of all but the middle pair whitish, showing plainer beneath; lores and supercilium whitish, a dark line through the lores and a dark patch just behind the eye; sides of the neck, chest, and breast, together with the flanks and under tail-coverts, chestnut-brown; chin, throat, centre of the breast, and belly white; thighs chestnut-brown; under wing-coverts fulvescent. When this plumage is first acquired in autumn the tinting of the underparts is brighter, almost approaching chestnut.

Summer plumage. Female (Cheefoo, May). The upper surface scarcely so dark as the above; the edgings of the feathers and the colour of the rump less rusty; the stripes on the head and back rather narrow and well defined against the surrounding colour of the feathers; the rump and upper tail-coverts with broad terminal black streaks; tail rusty olive-brown; sides of the breast and the flanks less rusty than in a winter-plumaged bird; the sides of the neck and chest marked with obsolete bars, the remains of the immature spots; under tail-coverts streakless; tips of the tail-feathers whiter than in my Ceylonese specimens.
Wing 2·5 inches; tail 2·2; bill to gape 0·68.

Young (Yenesaisk). In first plumage the young have the edges of the head-feathers olive-grey, the centres being black, as in the adult; back and rump rusty brown, the feathers broadly edged with black; wings very dark brown, the innermost secondaries almost black, and together with the wing-coverts edged with rusty olivaceous; tail blackish brown, tipped with olivaceous grey; the central feathers not so dark as the others, which are edged with earthy brown; lores blackish; a dusky whitish supercilium; chin and throat yellowish, the fore neck marked with dark streaks and washed with rusty brownish, which is the colour of the flanks, abdomen, and under tail-coverts; breast paler than the throat. After the first moult a young bird shot in China in September has the upper surface rich ferruginous, with the back-feathers very broadly streaked with black; tail black, edged with olivaceous rusty; wing-coverts and inner secondaries black, edged with rusty; chin and throat yellowish; chest and flanks rich rusty brown, with broad central spots of dark brown on the fore neck; under tail-coverts striped with brown; tail beneath tipped pale.
For an examination of these interesting specimens I am indebted to the kindness of my friend Mr. Seebohm.

Obs. Allied to the present species (the young of which, according to Mr. Seebohm, has been confounded with it) is the Eastern-Siberian and Kamtchatkan species *L. ochotensis*. A male in Mr. Seebohm's museum measures

2·62 inches in the wing and 2·4 in the tail. It has the upper surface more uniform than in *L. certhiola*, the dark centres of the head and back-feathers being almost obsolete; the lower back and rump are uniform rusty brown: wings plain brown, edged with rusty; tail rusty brown, with dark subterminal patches and light tips to the feathers; throat, breast, and lower parts white, with a brownish wash on the chest. This form has a more eastern general distribution than the subject of this article, being found round the sea of Okhotsk, and is said to winter in Borneo and other Malay islands. *Locustella nevia* of Europe is likewise not distantly allied to the present species; it has the upper surface more olivaceous, and wants the rusty hue characteristic of *L. certhiola*; the dark centres of the upper-surface feathers are not pronounced, and the tail is uniform olive-brown, without the black subterminal patch and whitish tips; the plumage of the under surface is not unlike that of *L. certhiola*; the bases of the under tail-coverts are dark, and there are dark mesial streaks reaching to the tips of the feathers. The example on which these remarks are based is in the collection of Mr. Seebohm, and was procured in Heligoland; it measures in the wing 2·4; tail 2·3; tarsus 0·75; bill to gape 0·6. A species common in China, the *L. macropus* of Swinhoe, which I take to be the same as *L. hendersoni*, resembles the European bird very closely, but has the wing and tail shorter; an example in the collection of the late Mr. Swinhoe has the wing 2·2 inches and the tail 2·0.

This group of birds is so close to the Reed-Warblers, *Acrocephalus*, that it can merely be considered to form a subgenus of the latter; and the only characters which warrant this distinction are the small rictal bristles and lengthened under tail-coverts.

Distribution.—This Grasshopper-Warbler has been only recently added to the avifauna of Ceylon; it was the last discovery made by myself before leaving the island. I met with it in the great swamp between the old and new Negombo canals in February 1877. This vast marsh, already several times referred to in this work, and which is called Mutturajawella by the Sinhalese, is covered from end to end with an almost impenetrable coat of dense and matted vegetation, in many places about 3 feet in height; and frequenting the thickest parts in it I found this bird. During several visits I made to this place I observed three or four examples, but only succeeded in shooting two of them. It is of course migratory to the island, and must of necessity pass through India on its way to Ceylon; but though Jerdon identifies it as a species which he found "in long grass in the neighbourhood of Mhow," Mr. Hume considers the bird thus spoken of to be the more eastern form, *Locustella hendersoni.* It is not quite clear what species the *L. rubescens* of Blyth (J. A. S. B. 1845, p. 582), found by him frequenting long grass in the neighbourhood of Calcutta, really is; for Swinhoe considered it, in his catalogue of the birds of China, to be identical with Middendorff's bird, *L. ochotensis*, for which species young examples of *L. certhiola* have been, it appears, hitherto mistaken. Mr. Seebohm, who was the first to obtain well authenticated examples of the young of *L. certhiola*, remarks, in his valuable paper on the birds of Siberia ('Ibis,' 1879, p. 13):—"Authentic skins of this bird in first plumage, now for the first time obtained, are very interesting. They prove that the various skins to be found in collections labelled *L. ochotensis* by Dyboffsky, from Lake Baikal, are simply the young of *L. certhiola.*" These I have described above; and from Jerdon's description of *L. rubescens* I should certainly say that it was nothing but the young of the present species. However, be that as it may, our Ceylonese bird is certain to be found in India: my specimens, when I first returned to England, were at once identified as *L. certhiola* by Mr. Seebohm; and now that I have, through the kindness of himself and Mr. Sharpe, been able to mature my acquaintance with the genus, I am myself prepared to state that the Ceylonese bird is *L. certhiola.*

It is found in various parts of Siberia, including the province of Trans-Baikal, and extends into China. Mr. Seebohm writes of it:—"As I passed through Yenesaisk on my return journey, towards the end of August, I found this rare Grasshopper-Warbler breeding in the swampy thickets near the bank of the river."

In the 'Birds of Mongolia,' translated into English in Rowley's 'Orn. Miscellany,' Col. Prjevalsky writes as follows:—"It is tolerably abundant in the Hoang-ho valley, but is very rare at Ala-shan and Halha, inhabiting only small clear marshes. We did not obtain it more than once in Kan-su. It is extremely common in the Ussuri country. On the coasts of the Japanese Sea I observed the species migrating in the early part of October." In Eastern Siberia it was procured by Taczanowski; and Père David obtained it in Central China, but not at Pekin, as stated by Swinhoe in the "Birds of China" (P. Z. S. 1871, p. 354).

Habits.—I found this species frequenting the tangled and almost impenetrable grass in the above-mentioned marsh; it lurked in the thickest parts near the ground, and did not take flight until almost trodden on, when

it darted out with a quick jerky flight into the nearest tussocks, from which I found it, in several instances, impossible to drive. It frequented the same spots from day to day, as on escaping my pursuit on one occasion I was sure to find it, at my next visit, in the same place. I was unable to detect it uttering any note save a little *chik* of alarm; but in the breeding-season it very likely has a somewhat similar creaking song (like the noise of a cricket or grasshopper) to that which has earned for its European relative the name of Grasshopper-Warbler. Mr. Seebohm remarks of it, as observed in Siberia in August, that he "found it very shy and skulking in its habits. The young birds," he writes, "some only half-fledged, were still in broods; and occasionally I got a shot at one which left the sedges and ventured into the willows. They were calling anxiously to each other, the note being a harsh *tic, tic, tic.*"

All the members of this interesting group of Warblers are characterized by their skulking habits. The English bird (*L. nevia*), which arrives in the country in April, secretes itself in thick branches and grassy underwood, out of which I have seen it running like a mouse. We read of it in Yarrell that "except on first coming, when the cocks, awaiting the arrival of their mates, display themselves more than is their wont, it is at all times difficult, and in the breeding-season, when bushes and shrubs are clothed with leaves, almost impossible to obtain a sight of it." It is said to sing more at sunrise than any other time, and it has the power of pitching its note so that it is very difficult to determine the direction from which it comes. This is said to arise from the bird turning its head, which produces a remarkably ventriloquistic effect, already noticed in this work in the case of other species.

Genus PHYLLOSCOPUS.

Bill straight, rather slender and wide at the base; the culmen curved at the tip only; tip notched. Nostrils oval and lengthened, placed in a wide membrane; rictal bristles scanty. Wings long; the 1st quill exceeding the primary-coverts, the 3rd and 4th the longest, the 2nd variable in length. Tail of 12 feathers, slightly emarginate. Tarsus longer than the middle toe and shielded with smooth scutæ. Feet small.

PHYLLOSCOPUS NITIDUS.

(THE GREEN TREE-WARBLER.)

Sylvia hippolais, Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. p. 6.

Phylloscopus nitidus, Blyth, J. A. S. B. 1843, xii. p. 965; Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 263; Layard & Kelaart, Prodromus, App. Cat. p. 57 (1853); Jerdon, B. of Ind. ii. p. 193 (1863); Holdsworth, P. Z. S. 1872, p. 457; Adam, Str. Feath. 1873, p. 382; Legge, ibis, 1874, p. 22; Seebohm, Ibis, 1877, p. 72.

Abrornis nitidus (Bl.), G. R. Gray, Gen. B. i. p. 175 (1848).

Regulus nitidus (Bl.), Bonap. Consp. Gen. Av. i. p. 390 (1850).

Adult male and female. Length 4·5 to 4·75 inches; wing 2·5 to 2·6; tail 1·65 to 1·8; tarsus 0·65 to 0·7; mid toe and claw 0·55; bill to gape 0·55 to 0·6; bastard primary about 0·3 longer than the primary-coverts.

Iris dark olive-brown; bill dark along culmen, margin of upper mandible and almost all the lower fleshy; legs and feet brownish fleshy, or the tarsus bluish grey and the feet olivaceous in some.

Above olivaceous greenish; the breast slightly darker than the back; wings and tail brown, edged with the hue of the upper surface; the outer primaries pale-edged; basal inner edges of quills whitish; greater wing-coverts with whitish tips, forming a slight bar across the wing; superciliary streak and beneath the eye greenish yellow-white; lores and a streak at the posterior corner of the eye brown; beneath whitish, tinged with flavescent greenish, generally brightest on the chest; flanks shaded with dusky grey; tail-feathers in some tipped beneath with greenish white, but not so conspicuously as in *P. magnirostris*; shafts of the tail-feathers beneath white.

Summer plumage. The above description is taken from Ceylon-killed winter specimens. Mr. Seebohm recognizes a difference in the breeding attire. Specimens I have examined from Northern India certainly appear to differ from mine in being uniform dull pale green above, the head concolorous with the hind neck, and the upper tail-coverts paler than the back, having a yellowish tinge.

Obs. This Tree-Warbler and the two following are among those classed by Mr. Seebohm in the section which have no mesial line on the crown, in addition to which the under mandible is pale and the wing-coverts are tipped whitish, forming one and sometimes two bars across the wing. It is very closely allied to the Greenish Tree-Warbler, but can be easily distinguished from that species, as I shall presently point out. I have submitted all my specimens to Mr. Seebohm for examination, and have myself compared them with examples of the Greenish Tree-Warbler, *P. viridanus*, and there is no doubt that they are all *P. nitidus*. A male from Futteghur, in Mr. Anderson's collection, measures 2·5 inches in the wing, and three females vary from 2·3 to 2·4 inches.

Distribution.—This diminutive Warbler migrates in great numbers from the Himalayas through India to Ceylon, spreading over the whole island, from the sea-coast to the summits of the highest mountains, and frequenting all districts independently of climate or nature of locality. It is equally at home in the Suriah-trees in the streets of Colombo and in the heart of the forests of the Northern Province. It arrives in the island about the middle of September, and departs again at the end of March and the beginning of April. By the end of September it may be found all over the coffee-districts and throughout the extreme south of the island. It is common at Nuwara Elliya and in the circumjacent forests, and frequents the woods on the Horton Plains; while I have even procured it on the summit of Totapella, one of the mountains which overlook this elevated tableland.

The Green Tree-Warbler is spread throughout India in the cold weather, and breeds, in all probability, in the Himalayas. It would seem to be less numerous in the central portions of continental India in the cool season than it is in Southern India and Ceylon. Jerdon writes that he frequently procured it in the hills of the peninsula; and Mr. Bourdillon remarks of it, "common in heavy jungle, for the most part frequenting high trees, but sometimes descending to the underwood." As regards the north, Jerdon states that it is rare about Calcutta; and Blyth writes that it is generally distributed, but rare in Lower Bengal. I have seen

specimens collected at Futteghur and at Etawah. About the Sambhur Lake Mr. Adam says that it is very rare; and it has only lately been added to the avifauna of Sindh, having been procured at Kotri by a collector of Mr. Blanford's. But there is much more still to be learnt about the distribution of this tiny Warbler. The extraordinary fact of a specimen of it having been shot in Heligoland some years since proves that it must breed in Western Siberia. Many species, singularly enough, after breeding in Northern Asia stray, on their migration back, westwards through Europe till they find their way to the little island of Heligoland; and this example of the Green Tree-Warbler must have been, as Mr. Seebohm infers, *loc. cit.*, a young bird which had got out of its track.

Habits.—This species frequents the upper branches of umbrageous trees, no matter whether they may be situated in busy thoroughfares or in the quiet of the forest. It is especially fond of Jack-trees, which are mostly found in the gardens of the natives, and again is very partial to the monarchs of the forest which surround the many romantic tanks of the interior. In these spots its perpetual little chirrup invariably discloses its presence when otherwise it would certainly be passed over in the lofty foliage which it frequents. It affects the leaves of trees more than the next species, and darts out from its place of concealment on various insects, after the manner of a Flycatcher. It is very lively in its actions, and is sociably inclined, for one or two of its fellows may usually be found in an adjacent tree, each answering the other with its cheerful little note. Its flight is swift, although its powers of locomotion are not much brought into play after it once locates itself in its winter quarters; it then merely darts from tree to tree, and often remains for a considerable time without moving out of its retreat. The powers of wing which these little *Phylloscopi* have are marvellous; that they should be able to make their way across such a chain of mountains as the Himalayas, as some of them undoubtedly do, is one of the greatest wonders connected with the migration of birds.

PHYLLOSCOPUS MAGNIROSTRIS.

(THE LARGE-BILLED TREE-WARBLER.)

Phylloscopus magnirostris, Blyth, J. A. S. B. 1843, xii. p. 966; Jerdon, B. of Ind. ii. p. 191 (1863); Brooks, Ibis, 1872, p. 26; Hume, Str. Feath. 1873, p. 439 (first printed record from Ceylon); Legge, Ibis, 1874, p. 22; Brooks, Str. Feath. 1875, p. 243; Seebohm, Ibis, 1877, p. 77; Hume, B. of Tenass., Str. Feath. 1878, p. 352.

Phyllopneuste magnirostris (Bl.), G. R. Gray, App. Hodgs. Cat. B. of Nep. p. 15 (1846).

Phyllopseuste magnirostris (Bl.), Hume, Str. Feath. 1874, p. 236.

Phylloscopus javanicus, Blyth, Cat. B. Mus. A. S. B. p. 185 (1849).

The Large-billed Willow-Warbler.

Adult male and female. Length 4·9 to 5·2 inches; wing 2·5 to 2·75; tail 1·85 to 2·0; tarsus 0·7 to 0·8; middle toe and claw 0·55; bill to gape 0·5 to 0·6.

Iris light or yellowish brown; bill dark horn, with the base and tip of lower mandible fleshy; gape pale; legs and feet bluish grey or dusky bluish.

Above dusky olive-greenish, paling on the rump; wings and tail brown, edged with a pale greenish hue, and the latter tipped with the same; greater coverts with pale terminal spots, forming a wing-bar; a whitish supercilium from the nostril over the eye to the ear-coverts; lores and a moderately large space behind the eye dark brown; cheeks mingled brown and greenish white; beneath whitish, washed with flavescent greenish, with the flanks and sides of the chest cinereous brownish (in some the whole chest is overcast with dusky); under tail-coverts greenish white; under wing greenish yellow.

Obs. This Warbler is easily recognized from the last species by its stouter build and darker upper plumage, also by the dark head and space behind the eye, over which the rather conspicuous supercilium reaches; these are differences which prevent it being confounded for a moment with *P. nitidus*, where the larger bill might at first be overlooked, especially as this varies somewhat in size.

This Willow-Warbler is very closely allied to *P. lugubris*, another Indian species, the only reliable point of difference between the two being the proportion of the primary quills to one another. In the present species the *2nd and 8th primaries are subequal*, whereas in *P. lugubris, the 2nd primary is shorter than the 8th.* In one of my skins from Ceylon, the 2nd primary is somewhat shorter than the 8th; but it is so exactly identical with the rest of my series that it is not advisable to separate it. Mr. Seebohm has examined it and is of the same opinion. On the whole, I think, the wing of *P. lugubris* is shorter than in the present species; several specimens from Sikkim I have examined measure as follows:—2·6, 2·55, 2·4, 2·6, ♀ 2·5 inches, and they are, as a whole, a trifle darker on the upper surface than *P. magnirostris*. I have not procured a female of this latter with the wing less than 2·5 inches, and one specimen measures 2·6, although I see that Mr. Seebohm, in his excellent paper on the *Phylloscopi* already referred to, gives a minor limit of 2·23. Two examples from India measure 2·83 and 2·5 inches in the wing.

There is no reason to infer why *P. lugubris* should not occur in Ceylon; and I commend the subject of its discovery there to those who may hereafter pay attention to this genus in the island.

Both these species much resemble the Willow-Wren of Europe, *P. trochilus*; but this latter has no wing-bar, is slightly greener on the back, and the throat, chest, and under wing-coverts are washed with a brighter greenish yellow; the bill is smaller and legs longer. An example in my collection measures:—length 5·1 inches, wing 2·65, tail 2·1, tarsus 0·85, bill to gape 0·5. Iris brown; bill, upper mandible brown, lower fleshy; legs and feet brown.

Distribution.—Like the last species, this Tree-Warbler is migratory in the cool season to Ceylon, arriving and departing much about the same time as that bird. It is common in many parts of the island, particularly in the forest-region of the northern half and in the Eastern Province. I found it likewise in considerable numbers in some parts of the North-west Province, particularly on the Deduru oya and its tributaries, and also in the Ikkade-Barawe forest and other spots in the Western Province. In the Kandy country and in the upper hills it is likewise common. It was particularly abundant during the cool season of 1876–77; in January 1877, at

the Horton Plains, it was quite as frequent as the last-noticed bird. The first example recorded from Ceylon was shot by myself on the banks of the river in Lindula, in November 1870, and I have never detected it in any collections but my own. It is worthy of note that females are rare in Ceylon.

Jerdon writes as follows:—"It appears to be spread, but rare, over India. I obtained it at Nellore in the cold weather, and it has been procured near Calcutta and in Nepal." Its head-quarters, in the summer, seem to be the sub-Himalayan districts. Mr. Brooks found it in forest in Cashmere, and met with it in numbers in the valley of the Bhagarati river above Mussoori. In the winter it wanders down the eastern side of the Bay of Bengal, and is, according to Mr. Hume, a rare cold-weather visitant to the central portion of the province of Tenasserim. It likewise finds its way to the Andamans, where it was procured by Lieut. Wardlaw Ramsay, and also on Mount Harriet, above Port Blair, during Mr. Hume's expedition to the island in 1873.

Habits.—This Tree-Warbler frequents the upper branches of trees in jungle and forest, and does not affect the vicinity of human habitations like the last, preferring the retirement of the woods to the shelter of umbrageous trees in compounds, gardens, and other open places. It likewise does not seem to dwell so much among the leaves and boughs as *P. nitidus*. On hearing its sweet three-note whistle, which somewhat resembles the note of the Redbreast Flycatcher (*C. tickelliæ*), if you look up you will see the little bird, whence it comes flitting from one bare branch to another, peering down for an instant on you, and at the next rapidly darting among the surrounding foliage at some passing insect, and then realighting at some little distance off. These actions are so much like that of a Flycatcher, and its note so unlike the chirrup of the last species, that the first time I procured it under these circumstances I was surprised to find I had killed a Willow-Warbler instead of a Flycatcher. It constantly repeats its note as it moves from tree to tree in search of insects, which form its entire food; and it generally hunts singly, notwithstanding that one of its companions may usually be heard not far off.

Blyth writes of its song, "My shikaree, who shot it, informed me that it sung prettily; and on my imitating the well-known note of *P. trochilus* (the Willow-Wren), he assured me that the song of this bird was quite different." Mr. Brooks, who has paid so much attention to the members of this genus, says that its song is peculiarly shrill and sweet, but is the most melancholy one that could be imagined. He further writes, concerning his observations of the species in the Mussoori district, "I frequently heard its song near Danguli, and again not far from Gangaotri. Also on the road from Sansoo to Kauriagalia, in a rocky wooded glen through which a small stream flowed. The conditions this bird requires are wooded cliffs or very steep rocky banks impracticable for man, and plenty of flowing water below. Above a roaring torrent it is in its element, and sings most vigorously . . . . It is very shy and of a retiring disposition, and the female is rarely seen. But for its song the male also would escape observation."

PHYLLOSCOPUS VIRIDANUS.

(THE GREENISH TREE-WARBLER.)

Phyllopneuste rufa, Blyth, J. A. S. B. xii. p. 191 (1842), *nec* Bodd.

Phylloscopus viridanus, Blyth, J. A. S. B. 1843, xii. p. 967; Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 263; Layard & Kelaart, Prodromus, App. Cat. B. p. 57 (1853); Jerdon, B. of Ind. ii. p. 193 (1863); Holdsw. P. Z. S. 1872, p. 457; Brooks, Ibis, 1872, p. 31; Henderson & Hume, Lahore to Yarkand, p. 220, pl. 19 (1873); Scully, Str. Feath. 1876, p. 148; Seebohm, Ibis, 1877, p. 73.

Abrornis viridana, Bonap. Consp. Gen. Av. p. 290 (1850).

Phylloscopus plumbeitarsus, Swinhoe, Ibis, 1861, p. 330; Seebohm, Ibis, 1877, p. 73; Brooks, Str. Feath. 1878, vii. p. 505.

Adult male and female. Length "4·75 to 5 inches" (*Jerdon*); wing 2·2 to 2·4; tail 2·0; tarsus 0·7; middle toe 0·4. claw (straight) 0·15; bill to gape 0·5. These measurements are from two specimens in my collection from Futteghur.

Dr. Scully gives the following complete measurements of a specimen killed in Turkestan:—Length 4·3 inches; expanse 7·15; wing 2·34; tail 1·8; tarsus 0·81; bill from gape 0·53; weight 0·35 oz.

"Bill, upper mandible dusky brown, lower mandible yellowish brown; irides dark brown; legs and feet brownish grey; claws brown horny." (*Scully.*)

Above dull olivaceous green, pervaded with a brownish hue, the rump greener than the back; primaries and secondaries brown, edged with the hue of the back; greater coverts tipped with whitish, forming a single wing-bar; tail brown. the feathers edged, principally near the base, with the colour of the upper tail-coverts; a dark spot in front of the eye; above it a rather wide yellowish supercilium passes from the nostril to above the ear-coverts, which are brownish; beneath from the chin to the under tail-coverts whitish, tinged slightly with greenish yellow; under wing-coverts washed with greenish yellow, brightest at the edge of the wing; shafts of the tail-feathers beneath white.

Obs. This species may be distinguished from *P. nitidus* by its browner upper surface and less yellow-tinged under-parts; it is aptly named the *Greenish* while the latter is styled the *Green* Tree-Warbler.

Distribution.—The evidence on which this bird takes its place in our lists rests on the following statement of Layard's, who writes, in speaking of a Warbler which he calls *Phyllopneuste montanus*, Blyth:—"The present species is migratory, and abounds in low thick bushes in company with *Phyllopneuste viridanus.*" There is some error here, as there is no such bird as *P. montanus*, Blyth, and it is strange that the present species should be said to abound. Perhaps it may visit Ceylon; and if its note is not to be distinguished from that of the very numerous species first noticed, it would naturally be supposed by Layard to be common after he had once procured it. It is to be hoped that naturalists will pay particular attention to this point.

The Greenish Tree-Warbler, as hitherto considered, inhabits Cashmere, according to Mr. Brooks, in the breeding-season; and Jerdon procured it at Darjiling. It ranges, however, north of the Himalayas, as Dr. Scully procured it in Kashgharia, and Dr. Henderson found it common in Hill Yarkand at the Arpalak river. In the cool season it migrates to the plains, Blyth stating that it is very common in Lower Bengal. It is not unfrequent in the North-west Provinces; and Jerdon obtained it in Southern India. It passes to the eastward of the Bay of Bengal on to Tenasserim, whence Mr. Hume records it from Thatone, river Salween, and Moulmein.

Concerning its habits Dr. Scully writes:—"This species was noticed among the tamarisk and willow bushes fringing the Sanju stream, and along the banks of the Karakash river. It seemed very restless, continually flitting from spray to spray, and its note was a weak sort of chirp frequently uttered. Blyth pronounces its voice to be very weak, and to be expressible by *tiss-yip, tiss-yip*, frequently uttered.'

Presuming, however, that the *P. plumbeitarsus* of Swinhoe is the same as *P. viridanus* (and Mr. Seebohm informs me that he believes in the identity of the two species, the former being the summer plumage of the latter), the range of this Warbler becomes enormously extended, and reaches "in the breeding-season the subalpine districts of the North-eastern Palæarctic Region from the Ural to the Pacific. Prjevalsky found it in the breeding-season in the pine-districts of Camsu. It passes through China on migration, and probably winters in Burma and the East-India islands" (*Seebohm*). The identity of this northern species with our Indian *P. viridanus* might account for the fact of a skin of the latter having been identified by Messrs. Brooks and Seebohm in a collection made in the month of August in the Ural. It has likewise been recently procured in Heligoland by Herr Gätke.

On the other hand, however, Mr. Brooks gives it as his opinion, in the last number of 'Stray Feathers' (vol. vii. pp. 508–10), that Swinhoe's species is distinct from the present. He points out, among other points, that *P. plumbeitarsus* has a stronger, differently shaped and coloured bill, two wing-bars instead of one, which are yellowish instead of white, and also a darker upper plumage than *P. viridanus*.

Mr. Brooks found its nest in Cashmere at an elevation of about 4000 feet; it was a domed structure, on the steep bank-side of a ravine full of small birch trees.

PASSERES.

Fam. PARIDÆ.

Bill short and conical, with the tip entire. The nostrils concealed by a tuft of feathers; gape furnished with bristles. Wings rather long; the 1st quill about half the length of the longest. Tail moderate. Legs and feet stout; the tarsus scaled.

Of small size and of arboreal habit.

Genus PARUS.

Bill typical in form, the margin of the upper mandible lobed; the tip slightly more curved than the rest of the culmen. Nostrils circular and concealed by the impending tufts; rictal bristles feeble. Wings with the 4th and 5th quills subequal and longest, the 2nd shorter than, or about equal to, the 8th. Tail moderately lengthened and slightly graduated. Tarsus exceeding the middle toe and claw, and shielded with broad scales. Lateral toes short; hind toe and claw large.

PARUS ATRICEPS.
(THE GREY-BACKED TITMOUSE.)

Parus atriceps, Horsf. Trans. Linn. Soc. xiii. p. 160 (1820), "ex Java"; Sykes, P. Z. S. 1832, p. 92; Tweeddale, Ibis, 1877, p. 304.

Parus cinereus, Vieillot, Tabl. Enc. Méthod. p. 506 (1823), *ex* Levaillant; Blyth, Cat. B. Mus. A. S. B. p. 103 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 267; Kelaart, Prodromus, Cat. p. 121 (1852); Jerdon, B. of Ind. ii. p. 278 (1863); Holdsworth, P. Z. S. 1872, p. 460; Ball, Str. Feath. 1874, p. 417; Legge, Ibis, 1874, p. 23.

Parus nipalensis, Hodgs. Ind. Rev. 1838, p. 31.

Parus cæsius (Tick.), Swinhoe, P. Z. S. 1871, p. 361; Hume, Nests and Eggs, ii. p. 405; Brooks, Str. Feath. 1875, p. 253; Hume & Davison, B. of Tenass., Str. Feath. 1878, p. 376.

Le Mésange grise à joue blanche, Levaillant, Ois. d'Afrique, pl. 139; *Le Mesange cap nègre*, *The Tit*, also "*Coffee-bird*," Planters. *Ramgangra*, Bengal.; *Glate wingko*, Java.

Adult male and female. Length 5·3 to 5·8 inches; wing 2·6 to 2·9; tail 2·3 to 2·6; tarsus 0·7 to 0·75; middle toe and claw 0·6 to 0·7; bill to gape 0·48 to 0·55.

Some hill-birds are larger than those from the low country: a male from Horton Plains measures—length 5·8 inches, wing 2·9, tail 2·6; a male from Colombo—length 5·5 inches, wing 2·6, tail 2·2.

Iris dark brown; bill black, a slaty edge to the lower mandible; legs and feet dusky bluish or plumbeous; claws brown.

Head, nape, sides of neck, chin, throat, chest, and down the centre of breast, belly, and under tail-coverts shining blue-black, enclosing a large white patch, which extends from the gape over the cheeks and ear-coverts; back, rump, and wing-coverts cinereous bluish, with a whitish patch adjacent to the black nape; wings and tail black, edged with bluish, the longer primaries with narrow, and the tertials with broad white margins: greater coverts broadly tipped white; outer tail-feather white, with a broad black inner margin, the next with a variable white streak running up from the tip; sides of the breast, belly, under tail-coverts, and the lower portion of the thighs whitish, tinged with bluish grey on the flanks.

The amount of white on the outer tail-feathers varies; in some examples the outer web of the penultimate is wholly white. This may be the result of age. The size of the white nuchal spot varies much, and the black at each side of it descends further down the hind neck in some specimens than in others.

Young. Iris as in the adult; bill dark horn-colour; margin and gape yellowish.

The back of the head and chest has less gloss than in the adult; the ventral stripe is narrower; the back dusky bluish, with a greenish tinge.

Obs. Examples from India are identical with our Ceylon bird, which I cannot likewise separate from the Javan and Malayan form, although individual specimens may be perhaps chosen from a series of the latter which would not, in all respects, correspond with some from our island. This is only to be expected, as it is a species subject to local variation. A West-Javan skin has the wing 2·6 inches, and corresponds entirely on the upper surface with one from Ceylon; another from the same district measures 2·4 only, and is slightly darker on the back; another from East Java measures 2·4, and is paler than most Ceylonese examples. A Lombok specimen has a wing of 2·6 in length and tail 2·6; it is also a very pale bird, but differs in no other way. Swinhoe remarks, in his "Catalogue of the Birds of China" (P.Z.S. 1871), that the Javan bird can be readily distinguished from the continental one by "the black of the head extending beyond the white nuchal spot, and separating it from the grey of the back," and accordingly he applied a name of Tickell's (*P. cæsius*) to the Chinese and Indian bird, which has been in vogue in 'Stray Feathers' ever since. I do not see this character exemplified in the British-Museum specimens, and I have, since my examination of them, asked Mr. Sharpe to look at them. He informs me, *in epist.*, that he cannot see the distinction here referred to, although, in some examples, the "black bordering the white nape-spot is carried a little further down the mantle." I have referred to this above as an individual peculiarity in Ceylonese

birds, and it is therefore not a character of sufficient value to justify a separation of the two varieties. If it were, however, the name of *P. cæsius* would, in my opinion, be objectionable, as no one knows where Tickell first employed it, and he certainly never published it. Jerdon uses it as a synonym of *P. cinereus*; and this is our only authority for its employment at all. As to the latter title, it is three years junior to *P. atriceps*, and is therefore merely a synonym of it.

This Titmouse may be styled the Asiatic representative of the English "Great Tit," which has the distribution of the black on the head and throat and the white cheek-patch the same; but the back is greenish and the nuchal patch yellowish; the underparts are yellowish instead of greyish white.

Distribution.—The Grey Tit is very numerous in all the hill-districts of Ceylon, frequenting the highest parts of the main range and other forests above 3000 feet more abundantly than those of lower altitude. It is scattered over all the forest districts of the low country, but is not common near the sea. I met with it in most parts of the eastern side of the island and in the north-central jungles; and Mr. Parker informs me that it is common about Uswewa, in the Puttalam district. In the neighbourhoods of Colombo and Galle I have found it during both monsoons, but mostly in the cool season, and I believe that it is an occasional visitant only to those places. In the Morowak and Kukkul Korales, and likewise in the Saffragam and Pasdun-Korale jungles it is common, and probably visits the coast region from these localities. I never observed it close to Trincomalie, although it is tolerably frequent further inland.

Jerdon writes of the Grey Tit's distribution in India:—"This Tit extends throughout the Himalayas from Nepal to Bhootan, Assam, and through Central India to the Nilghiris. . . . . I have procured it on the Nilghiris, and it extends all along the range of Western Ghâts north to Kandeish. I have also obtained it in the hilly regions of Nagpur and at Saugor, and Tickell got it at Chaibassa, in Central India, but it does not occur in Bengal." In Travancore it is, according to Mr. Bourdillon, not uncommon at higher elevations. It is, in fact, chiefly found in hilly wooded tracts of country: at Mt. Aboo, for instance, Captain Butler records it as occurring sparingly, though very rare in the plains, where he procured it once in the month of June, about 18 miles from Deesa; and Mr. Hume writes that it is found in the Gir and Girwan districts, in Kattiawar, and the Koochawun and Marot jungles north of the Sambhur Lake, but nowhere else in the entire region. An exception to this rule, however, is found in Dr. Armstrong's notes on the Birds of the Irrawaddy delta, in which he writes:—"This species was met with abundantly in the open tidal jungle bordering portions of the coast between Elephant Point and China-Bakeer, and also in similar localities along the margin of the Rangoon river at Eastern Grove." It is found in various parts of Burmah, and is a rare straggler to the central portions of the province of Tenasserim. It is likewise, no doubt, an inhabitant of the Malay Peninsula, which forms a link between its Indian and Malayan habitat. It was first described from Java by Horsfield; to the east of that island it is found in Lombok, and to the west in Sumatra. A region quite as remote as these islands is the east coast of China, to the avifauna of which Swinhoe added this Tit; he found it in the island of Hainan, and writes that his specimens thence procured were identical with those from India.

A notice of this bird's distribution would not be complete without referring to Levaillant's remark on it as a South-African species; he says, "It was the only species" (of Titmouse?) "I saw in the vicinity of the Cape or in the colony!"

Habits.—This interesting little bird, like its European congeners, possesses a restless and inquisitive disposition, and is a most diligent worker when in search of its insect food. It consequently frequents a variety of situations, and intrudes itself upon the notice of the most casual observer. In the hills it is found in pairs, or two or three together, in forest, thick jungle, and patna-woods; it is likewise common on estates, the well-grown coffee-bushes affording it such a welcome shelter that it appears to live permanently among them; thence it makes casual raids upon the neat little gardens attached to so many bungalows, and deals destruction to the buds and young shoots. In the low country it resides chiefly in forest; but its wandering disposition brings it often into the vicinity of habitations, where it locates itself for the time being in the shady compounds and pleasant groves among which the villagers pass their existence. There it frequently resorts to the heads of cocoanut-trees, searching among their flowers and at the bases of the broad fronds for the numerous insects which affect these favourite situations. On the Horton-Plain woods, where it is common, it delights in the

moss-covered trunks and limbs of the rather stunted timber-trees of that elevation, and attentively scrutinizes every nook and cranny in quest of its morning meal. While hopping about the branches of trees, it gives out a sharp two-note whistle, and repeats it for a considerable time, after the manner of its European relative. I am not aware whether it has the interesting habit of tapping branches in the same style which must be familiar to all who have observed our Great Tit in England during the autumn and winter. No little bird can possess a more thoroughly busy and at the same time contented air than this one, when he is diligently working away at the branch of some find old apple-tree, making his well-directed blows heard at a considerable distance from his perch.

Jerdon says of the Grey Tit, "it is a very familiar and abundant bird on the Nilghiris, with the usual habits of the tribe, entering gardens, and feeding on various small insects and also on seeds." Dr. Armstrong observes that it is very active, "moving from one bush or tree to another, and frequenting alike the highest *Sonneratia*-trees and the lowest mangroves."

Nidification.—In the Central Province this species breeds from March until July. It usually selects a hole in some moderately-sized tree, perhaps one which has been cut by a Barbet or a Woodpecker, and at the bottom of this retreat forms a large and slovenly nest of moss, feathers, and hair. It lays from four to six eggs, broad ovals in shape, pure white, openly spotted with well-defined marks of purplish red, which often form a zone round the large end. It often chooses a hole in a bank, and has been known to build *on* a branch of a tree, Mr. Hume citing an instance of a nest so situated in a "Banj" tree, 10 feet from the ground.

This author states that they rear two broods in India, the first in March, the second in June, while in the Nilghiris they lay as late as September and October. Miss Cockburn, who has made so many interesting notes on the nidification of birds at Kotagherry, remarks that they show great affection and care for their young, and that they bite savagely at the hand of an intruder, puffing out their throats and hissing like a snake. The average size of a number of eggs taken in India is stated to be 0·71 by 0·54 inch.

PASSERES.

Fam. CERTHIIDÆ.

Bill variable, either straight or much curved, but always compressed and with the tip entire. Tail variable, rather long in some, with the shafts rigid and pointed, in others short and even at the tip. Legs short; feet very large; toes in many syndactyle, the hind toe and claw larger than the rest.

Of scansorial or climbing habit.

Subfam. SITTINÆ.

Bill straight and rather short. Tail shorter than the wings and even at the tip.

Genus DENDROPHILA.

Bill straight, widened at the base; the culmen gently curved from the base to the tip. Nostrils oval and lateral; a few weak rictal bristles. Wings long, pointed; the 1st quill exceeding the primary-coverts by about 0·2 inch, the 4th the longest, and the 2nd shorter than the 6th. Tail very short, slightly exceeding the closed wing. Tarsus short, scaled, exceeding the middle toe, which is shorter than the hind; outermost toe much exceeding the inner and syndactyle; hind claw very large and much curved.

DENDROPHILA FRONTALIS.

(THE INDIAN BLUE NUTHATCH.)

Sitta frontalis, Horsf. Trans. Linn. Soc. xiii. p. 162 (1821).

Sitta corallina, Hodgson, J. A. S. B. 1836, v. p. 779; Gray's Zool. Miscell. p. 82 (1840).

Dendrophila frontalis (Horsf.), Jerdon, Madr. Journ. 1839, xi. p. 218; Blyth, Cat. B. Mus. A. S. B. spec. B & C, p. 190 (1849); Kelaart, Prodromus, Cat. p. 120 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 176; Jerdon, B. of Ind. i. p. 388 (1862); Holdsw. P. Z. S. 1872, p. 435; Hume, Nests and Eggs, i. p. 161 (1873); Legge, Ibis, 1874, p. 16; Bourdillon, Str. Feath. 1876, p. 393; Fairbank, ibid. 1877, p. 399; Hume and Davison, B. of Tenass., Str. Feath. 1878, p. 201.

Dendrophila corallina (Hodgs.), Hume, Str. Feath. 1875, p. 89; Sharpe, ibid. 1876, p. 436.

The Velvet-fronted Nuthatch, Jerdon; *The Tree-creeper*, *The Blue Creeper*, Europeans in Ceylon.

Adult male and female. Length 5·1 to 5·2 inches; wing 2·9 to 3·15; tail 1·8; tarsus 0·65 to 0·7; middle toe and claw 0·75; hind toe 0·5, its claw (straight) 0·35; bill to gape 0·67 to 0·73.

Iris pale golden yellow, eyelid greenish leaden, orbital skin dusky yellowish; bill coral-red, the tip of upper mandible nearly always blackish; legs and feet wood-brown, claws pale horny, soles dull yellowish.

Male. Above cærulean blue, somewhat deeper on the upper tail-coverts and shoulder, and changing at the edge of the frontal band into lazuline blue; lores, a broad band across the forehead, and a streak over the eyes to the nape deep velvety black; quills and most part of tail dull black; secondaries edged with the hue of the back; several of the primaries with a whitish-blue margin; central tail-feathers dull blue, and the tips and outer edges of the remainder bluish, the under surface of the feathers being greyish; just below the eye a slight wash of blue; cheeks, ear-coverts, and the neck just beneath them lilac; chin and upper part of throat whitish, changing into the brownish- or fulvous-lilac of the whole under surface; tibia and under tail-coverts washed with bluish grey.

Female. Wants the black superciliary stripe, and has the lores edged with bluish. In most specimens I have seen there is a series of one or two dark spots across the shaft of the centre tail-feathers, which seems peculiar to this sex.

Young. The bird of the year has the terminal portion of the upper mandible blackish, and the sincipital stripe, in the male, smaller than in the adult.

Obs. Mr. Sharpe, on the evidence of a small series of skins in the British Museum, has recently pointed out that the Javan bird is distinct from the Indian, inasmuch as it has the throat concolorous with the chest and not white as in the latter, and also the under surface richer in colour. I have examined the series in question, and also some skins of the late Mr. A. Anderson's collecting, and find that 3 Malayan examples from Java, Sarawak, and

Palawan do differ in the above respects from the continental Indian and the Ceylonese specimens. The series, however, is too small, it appears, to form a correct conclusion from; for I find that Mr. Hume, commenting on this subject in 'Stray Feathers,' 1878, vol. vii. p. 459, states that he has "numerous Indian and Burmese specimens exhibiting in a marked degree the alleged characteristics of both forms,"—that is, that both white and lilac-coloured throats exist in continental birds. This being the case, I do not think it advisable to place the Ceylonese birds at present under Hodgson's name, as, although all my specimens exhibit the white-throated character, I have not enough of them to base a safe conclusion on. As regards size, there is but little to choose in either of the alleged races. Mr. Oates gives the wing-measurements of four males from Pegu as 2·75 to 3·0 inches; and the wings of those I have examined are as follows:—*D. corallina*: ♀, Burmah, 2·75 inches; ♂, Nepal, 2·9; ♀, Nepal, 2·7; ♀, N.W. Himalayas, 2·85; ♂, Pegu, 2·95. *D. frontalis*: ♀, Sarawak, 2·8; ♀, Palawan, 2·8; Java, 2·9. I must remark that these examples from the Malay region seem to be slightly more purple on the back than the Indian birds; and I do not think the matter can be definitely settled until a large series is procured from Java and the fact is ascertained satisfactorily whether the Javan birds have or have not white throats *occasionally*. Hodgson bestowed his title on a Nepalese skin; and Gray subsequently applied it to birds from Nepal, Ceylon, and Pegu, placing the Burmese form with the Javan as *D. frontalis*, his distinction being that the latter was smaller and had a darker bill than *D. corallina*. The latter character is peculiar to immature birds.

Distribution.—This pretty little Creeper is numerous throughout all the hill-zone, inhabiting the upper ranges to their summits, and is likewise common in the forests and fine tree-jungle of all the low country. In various parts of the northern forest tract wherever the trees are large and lofty it is numerous; and this is likewise true of the Eastern Province and the forest regions of the south-east, along the rivers of which, as well as in the country between Pollanarura and Anaradjapura, I have found it almost as abundant as in the hills. It frequents the timber-jungles between the southern ranges and Galle, and is common in the Pasdun Korale and in the timber-forests of Saffragam. It occurs sometimes, during the north-east monsoon, on the sea-board between Colombo and Galle.

On the continent this Nuthatch is found in the wooded and hilly districts of India, from the extreme south to the Himalayas, and extends south-eastwards through Burmah and Pegu to Tenasserim. It appears to be very abundant in the hills of the south of the Indian peninsula. Jerdon speaks of it being numerous in the Nilghiris, and further remarks:—"I have found it on the Malabar coast, ... in Central India, in Goomsoor, and also in the Himalayas. It is also found in Assam and Burmah. On the Himalayas I only found it in the warmer valleys." Mr. Bourdillon says it is a common species in the hills of Travancore, "frequenting the margins of clearings in the forest;" and on the Palanis it is, according to Dr. Fairbank, found wherever there are trees, both at the top and bottom of the range. He likewise obtained it on the Goa frontier. Tickell procured it in Dholbhúm, and it has been obtained all along the sub-Himalayan region from the north-west to Darjiling. It is recorded from Assam by M'Clelland, and from Arrakan by Messrs. Barry and Anderson. Mr. Oates writes that it is very common in the Pegu hills. In Tenasserim it is noted by Messrs. Hume and Davison from many localities; and these gentlemen consider it to be common everywhere throughout the province up to 5000 feet, though it is not as numerous, according to the latter gentleman, as in the Nilghiris. Its range through the countries to the south, in common with that of all birds in these imperfectly explored regions, is not so well known. It is believed to be found all down the Malay peninsula to the very south, and probably occurs in Sumatra, as it is found in the next island, Java, and further east still in Borneo, whence it has been sent from the province of Sarawak.

Habits.—This pretty little species, which recalls to the wanderer in the wilds of Ceylon the familiar little Nuthatch of England, lives in small troops of half a dozen or so, and is in its habits one of the most active birds imaginable. It is ever on the move, nimbly running up and down and round the trunks of trees, traversing and retraversing the huge boles which protrude from the giant pillars of the forest, or tripping along beneath the massive limbs which grandly overhang the solitary sylvan tanks of Northern Ceylon. It does not remain long in one tree, but darts quickly on from one to the other, followed by its companions, and when it alights gives out its trilling little note, which, although comparatively weak, is audible at a considerable distance. In the tall timber-forests of the Central Province which grow on steep inclines this little note may be heard far overhead, as one is toiling up the face of the mountain, although it is often scarcely possible to

discover the tiny little birds, so difficult are they to discern in the gloom against the sombre-coloured bark. While searching for its food it frequently runs *down* the bark as well as up and across it, locomotion in any direction being alike easily performed by it; it may likewise just as often be seen running along fallen logs or over small dead wood lying on the ground; and in this situation I have not unfrequently observed it near paths and cart-tracks in the forest. It must, during some portion of the day, rest from its labours; but I have never succeeded in finding it in a state of quiescence.

Mr. Davison writes of it as follows:—"They are always busy working up and down and round and round the branches of trees, standing and fallen, sometimes even foraging in brushwood, always, like the rest of the *Sittas*, coming down head foremost, never tail foremost, as some Woodpeckers will; feeding exclusively on insects; often hammering away at the bark and constantly uttering a sharp *chick, chick, chick*, rapidly repeated as they work about, but not as they fly."

Besides this well-known sound in the Ceylon forests I have heard the males utter a short little warble, with which they answer one another while feeding.

Nidification.—I am unable to give any particulars of this bird's nesting in Ceylon. In India Mr. Thompson notes it as breeding in the Kumaon forests, where it is common in May and June. Mr. Davison has found its nest at Ootacamund in April, and Miss Cockburn at Kotagherry as early as the 10th of February. It builds in a small hole in a tree, a natural cavity in itself, but with the entrance, according to Mr. Hume, trimmed by the bird. The nest, a compact structure, is made of moss and moss-roots, and lined with feathers and hair.

Miss Cockburn has an interesting note, in 'Nests and Eggs,' on the finding of one of these nests, in which, among other details, she describes the manner in which the parent bird entered its nest; she writes to Mr. Hume, after describing an inquisitive visit of a Titmouse to the opening, which he found too small and soon flew away from:—"I continued to watch, and was quite repaid by seeing a Velvet-fronted Nuthatch fly to *the top of a tree containing the nest* [the italics are mine] *and descend rapidly down the trunk*, which was about 12 or 13 feet high, knowing well where the nest-hole was, and disappear into it."

The eggs are three or four in number, white, "blotched, speckled, and spotted, chiefly, however, in a sort of irregular zone round the large end, with brickdust-red and somewhat pale purple." An egg taken by Miss Cockburn measured 0·68 by 0·55 inch.

PASSERES.

Fam. CINNYRIDÆ *.

Bill slender, lengthened, compressed and curved throughout, very acute at the tip, which is entire. Nostrils linear, placed in a capacious membrane. Gape smooth. Wings more or less pointed, with the 1st quill exceeding the primary-coverts. Tail of 12 feathers, usually rather short, the central feathers in some genera elongated. Legs and feet stout. The tarsus strongly scaled; hind toe and claw large.

Of small size; mostly of brilliant metallic plumage. Tongue lengthened and bifid.

Subfam. NECTARINIINÆ.

Bill typically curved and slender. Wings with the 1st quill slightly longer than the primary-coverts. Tail even, or with the central feathers attenuated and much longer than the next pair.

Genus CINNYRIS.

Bill variable in length and curvature, much compressed, the margins of both mandibles inflected towards the tip. Nostrils overlapped by the membrane. Wings with the 3rd and 4th quills the longest, the 2nd either equal to or shorter than the 7th, and the 1st not half the length of the 2nd. Tail *short and even.* Tarsus longer than the middle toe and claw; the outer toe not much shorter than the middle, and joined to it at the base; hind toe equal to the middle, its claw large.

CINNYRIS LOTENIUS.

(LOTEN'S SUN-BIRD.)

Certhia lotenia, Linn. Syst. Nat. i. p. 188 (1766).

Cinnyris lotenius (L.), Cuv. Règne An. i. p. 412 (1817); Bonap. Consp. Gen. Av. i. p. 408 (1850); Shelley, Monog. Cinnyr. pt. v. (1877); Fairbank, Str. Feath. 1877, p. 399.

Nectarinia lotenia (L.), Jard. Monogr. Sun-birds, pp. 220, 263, pl. 23 (1842); Blyth, Cat. B. Mus. A. S. B. p. 224 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 175; Gould, B. of Asia, pt. viii. p. 3, pl. 3 (1856).

Nectarinia letonia (apud Layard) (*errore*), Kelaart, Prodromus, Cat. p. 119 (1852).

Arachnechthra lotenia (L.), Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 743 (1856–58); Jerd. B. of Ind. i. p. 372 (1862); Walden, Ibis, 1870, p. 23; Holdsw. P. Z. S. 1872, p. 434; Swinhoe, Ibis, 1873, p. 229.

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* I follow Captain Shelley in using the oldest *family* title for this group, although it has been usually styled Nectariniidæ, after the genus *Nectarinia*, the first established, I believe, for any of the Sun-birds.

Purple Indian Creeper, Edw. Glean. pl. 265; *Le Soui-manga pourpre*, Buffon; *Loten's Creeper*, *Polished Creeper*, *Green-gold Creeper*, Latham; *The Large Purple Honeysucker*, Jerdon; *Humming-bird*, *Long-billed Sun-bird*, Europeans in Ceylon.

Ran sutika, *Modara sutika*, *Gewàl kurulla*, Sinhalese; *Tahn-kudi*, Ceylonese Tamils; *Tutika*, Portuguese in Ceylon.

Adult male. Length to forehead 4·2 to 4·3 inches; bill along the culmen about 1·2, from gape across the arc to tip 1·1 to 1·13; wing 2·2 to 2·4; tail 1·8; tarsus 0·6; middle toe and claw 0·5; hind toe 0·3, claw (straight) 0·15.
Iris brown, variable in shade; bill, legs, and feet black.

Breeding plumage. Head, upper surface, lesser wing-coverts, and cheeks deep metallic green, glossed with purple in a contrary light; wings and greater coverts umber-brown; tail black, the edges of the feathers glossed with purplish towards the base; chin and centre of throat dull metallic purple, contrasting with the bright green of the cheeks, and deepening into metallic lilac on the chest, where it is bounded beneath by a narrow band of maroon-red; breast and lower parts uniform smoke-brown; a brilliant yellow tuft on each side of the breast, streaked in some examples with orange-red.

Winter plumage. After breeding the male bird moults, almost entirely assuming the plumage of the female, with the exception of a dark metallic stripe down the fore neck, and the lesser wing-coverts, which remain green; during the change the plumage is mingled fantastically with feathers of both dresses: one specimen I have examined in change has the upper surface a darker brown than a female, the upper tail-coverts tipped with green and the breast and flanks striped with brown; there is likewise a metallic purple band across the back.

Female. Length to forehead 3·8 inches; bill from gape, across arc to tip, 1·0; wing 2·15; tail 1·6.
Iris, bill, and legs as in the male.
Above glossy olive-brown, somewhat darker on the rump than on the back; wings darker brown, the inner webs darker than the outer, which have fine pale edges; tail black, the two outer pairs of feathers tipped deeply with dull white, the rest, with the exception of the middle pair, slightly less so; beneath dull sulphur-yellow, darkening into greyish on the flanks, the yellow of the fore neck abruptly set off down the sides of the neck against the brown of the upper surface; under wing-coverts yellowish white.

Obs. Ceylon birds of this species are a very little larger, have the bill slightly longer and more curved than, and have not the pectoral tufts so much striped with orange as the Indian race. Captain Shelley does not consider these differences of sufficient weight to entitle our bird to specific rank; and in this I agree with him. A South-Indian male specimen which I have examined measures 2·18 in the wing and 1·06 across the bill from gape to tip, and the bill is straighter than in Ceylonese birds; a female has it similarly shaped. The figure of the male bird in Captain Shelley's splendid monograph shows the orange markings of the pectoral tufts as they exist in Indian birds.

Distribution.—Loten's Sun-bird is very common in the Western Province, from Puttalam down the coast to Galle and Matara, and inhabits the interior of that side of the island as well in considerable numbers. It is fond of a damp climate, as on travelling round to the dry south-eastern district I found it much less common, it being mostly replaced in that part by the next species. It is found generally throughout the Kandyan Province up to about 3000 feet; but in Uva ranges to a higher altitude, and ascends from the Fort-Macdonald patnas, in the north-east monsoon, as high as the Hakgala gardens, in which Mr. Thwaites tells me he has observed it. I have not heard of its being seen at Nuwara Elliya; but if it has been rightly identified at Hakgala, it doubtless occurs there occasionally. It occurs on the Morowak-Korale hills. In the north it is much less numerous than *C. asiaticus*; and Mr. Holdsworth remarks that he never saw it in the Aripu district.

Jerdon writes of this species, "It is common on the Malabar coast, and also tolerably so in the more wooded parts of the Carnatic, as about Madras and other large towns." Messrs. Hume and Davison write to Captain Shelley that it is not found north of lat. 15° in the Indian peninsula, and, further, that "it is a bird of the plains, and does not ascend the hills, but is common in localities such as Calicut, Trichinopoly, Salem, and Madras itself."

In common with several other species, this bird owes its introduction to the scientific world to Governor Loten, who sent home the type specimens from Ceylon, and after whom it was named.

Habits.—Its lively manners, powerful song, and perhaps its remarkably long bill render this species the most showy of the Ceylonese Sun-birds, though in plumage it cannot vie with either of its congeners. It is found in most situations but forest, and is very partial to open bushy land studded with large trees; its love of frequenting gardens and compounds, in the flowering trees of which it finds employment for its long and brush-like tongue, makes it a familiar bird to both European residents and natives; and it always seems to be an object of admiration to the half-clad Singhalese boy who often accompanies the collector in his morning excursions. Besides feeding on the honey and pollen of flowers, it catches spiders and other insects; and one which Mr. Swinhoe shot at Galle in April had a number of small *Pipulæ* (hairy long-legs) in its gizzard. Oleanders and hedge-rows of "shoe-flower" trees (*Hibiscus*) are a favourite resort of this Sun-bird, and it may often be seen, half-flying, half-clinging to the flowers of this fine shrub while it inserts its long bill into the petals and extracts the honey therefrom. The male has a very lively and (for such a small bird) powerful song, which it utters from the tip top of a tree or when seated on some outstretching lateral branch, which is a favourite perch with it. While thus engaged in serenading its soberly clad partner, the bill is pointed upwards, as if to give full vent to its love-song, and its wings are anon opened and shut to add still more to the attractions of an already gay plumage. In India Jerdon writes that it frequents both jungles and gardens, and that he has seen it frequently enter his verandah to feed on spiders.

Nidification.—The breeding-season of this Sun-bird in the south lasts from February until May; and the nest is a pear-shaped, purse-like structure, suspended from a hanging twig. A lime or orange-tree is frequently chosen, and the nest placed about 5 feet from the ground. It is composed of fine grass, interwoven and decorated with bleached leaves and small pieces of bark, which are sown to the exterior with grass split into fine threads, the whole structure measuring about 7 inches by 3; the interior is composed of cotton from the pod, mixed with spiders' webs, and formed into a compact mass. The eggs are two or three in number, of a greenish-grey ground-colour, speckled throughout with two shades of light brown or brownish grey, sometimes forming a zone round the obtuse end. Dimensions—axis 0·64 inch, diameter 0·45 inch.

CINNYRIS ASIATICUS.

(THE PURPLE SUN-BIRD.)

Certhia asiatica, Lath. Ind. Orn. i. p. 288 (1790).

Cinnyris asiaticus (Lath.), Lesson, Man. d'Orn. p. 36 (1828); Shelley, Monogr. Cinnyr. pt. iv. (1877); Fairbank, Str. Feath. 1877, p. 399.

Cinnyris mahrattensis (Lath.), Jerd. Cat. B. S. Ind., Madr. Journ. 1840, xi. p. 224.

Nectarinia mahrattensis (Lath.), Jard. Monogr. Sun-birds, pp. 222, 264, pl. 24 (1843); Kelaart (*Nectarina* errore), Prodromus, Cat. p. 49 (1852).

Nectarinia asiatica (Lath.), Blyth, Cat. B. Mus. A. S. B. p. 224 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 175; Gould, B. of Asia, pt. viii. pl. 2 (1856).

Arachnechthra asiatica (Lath.), Jerdon, B. of Ind. i. p. 370 (1863); Walden, Ibis, 1870, p. 20; Holdsw. P. Z. S. 1872, p. 434; Hume, Nests and Eggs, p. 151 (1873); id. Str. Feath. 1873, p. 174; Ball, Str. Feath. 1874, p. 396; Legge, Ibis, 1875, p. 285; Morgan, *tom. cit.* p. 315; Hume, Str. Feath. 1875, p. 87; Fairbank, ibid. 1876, p. 256; Armstrong, *tom. cit.* p. 313; Hume, Str. Feath. 1878, B. of Tenass. p. 190.

Arachnechthra intermedia, Hume, Ibis, 1870, p. 436.

Nectarinia brevirostris, Blanf. Ibis, 1873, p. 86.

Purple Indian Creeper, Edwards; *The Yellow-winged Creeper*; *Sugar-Creeper*, *Mahratta Creeper*, *Eastern Creeper*, Latham; *The Short-billed Purple Honey-bird*, Kelaart; *The Purple Honeysucker* of some; *Purple Humming-bird*, Europeans in Ceylon. *Jugi-jugi* at Bhagalpur; *Dunbarg* in Sindh, Blyth.

Gewàl kurulla, Sinhalese; *Tahn-kudi*, Ceylonese Tamils.

Adult male. Length to forehead 3·7 inches; bill along culmen 0·73 to 0·77; wing 2·2 to 2·3; tail 1·4; tarsus 0·55; middle toe and claw 0·5.

Iris deep brown; bill, legs, and feet black.

Breeding plumage. Head, back, scapulars, lesser wing-coverts, upper tail-coverts, and the sides of the neck and throat brilliant metallic green, glossed on the back and upper tail-coverts with purple, the basal portion of the feathers on all these parts being black, and the metallic hue confined to the terminal parts; wings dark brown, the greater coverts and secondaries edged with purple; tail black, glossed with purple, and the feathers edged towards the base with green; chin, centre of throat, and chest lilac-purple, glossed with green, and changing into metallic blue on the chest; across the breast a narrow dull maroon band; beneath this to the under tail-coverts black, glossed with purple, which is glossed in some lights with green; under tail-coverts broadly margined with purple; on the sides of the breast, concealed beneath the closed wing, a bright yellow tuft, streaked with orange-red.

In those specimens which have come under my notice in Ceylon the maroon pectoral band has always been present, but, as I have not examined a large series, it may be absent in some birds. Captain Shelley says that he has found it thus in about half the examples he has seen, irrespective of locality.

Non-breeding plumage. Head, back, scapulars, and upper tail-coverts mouse-grey, with a short yellowish-white supercilium; wing black, the lesser coverts edged with metallic green, the greater series and the inner secondaries with purple; tail black, edged with metallic green; under surface variable, in some rather bright yellow, in others whitish tinged only with yellowish; a broad stripe of purple from the chin down the fore neck and breast; thighs dark brown.

This plumage in Ceylon is acquired in November and December in the Western Province; and, while in a state of moult, specimens are procured with both upper and under surface mingled with summer and winter feathers; the broad throat-stripe becomes clearly defined before the breast loses the metallic feathers.

Adult female. Similar to the male in size. Above olive-brown like the last species, with a narrow supercilium of yellowish white; wings brown, edged with a paler hue; tail blackish, the outermost feathers deeply tipped with white, and the rest successively less so towards the centre; beneath whitish, tinged with yellow on the chest.

Young. I have no specimens; but Blyth describes the young as being dark olive-green above and tolerably bright yellow on the underparts; wings dusky, with brownish margins to the tertials; tail black and its exterior feathers tipped with whitish.

Obs. Although I have not detected any difference in the size of the bill in different individuals in Ceylon, this species is subject to considerable variation on the continent in this respect, as well as in the colour of the gloss on the upper parts. In Ceylon this is undoubtedly green and not purple. In birds from Rangoon, according to Mr. Hume, the purple hue is chiefly developed; whereas it would appear that in the Baluchistan variety, described by Mr. Blanford as *C. brevirostris*, the upper surface is very green; but here, again, Mr. Hume remarks that many Indian examples are absolutely inseparable from Mr. Blanford's. As regards size, the type of the Persian or western variety quite equals Ceylon birds. Mr. Blanford's measurements are:—Total length 4·5 inches; wing 2·2; bill to gape 0·67; but, notwithstanding, it is stated to be smaller than typical *C. asiaticus*. Mr. Hume once separated the birds from Tipperah and other eastern parts, as well as those from the south of the peninsula, as *C. intermedius*, as he considered them to have larger bills and to be more brilliantly coloured; but neither he nor Captain Shelley now consider these species distinct from the true *C. asiaticus*, which may be said simply to vary in size of bill and colour according to locality. Mr. Hume gives it as his opinion that western birds from the dry-plains country run smaller and greener, while those from the well-watered eastern and southern regions run, as a rule, larger and purpler. To this I would add, as already stated, that Ceylon birds are also characterized by their green upper surface.

Distribution.—This Sun-bird is perhaps more local in its distribution than the last species. It is common in certain districts in the Western Province wherever the country is open and bush-covered, and is accordingly an inhabitant of the environs of Colombo. In the south-west it occurs rather sparingly; but in the scrubby country beyond Hambantota, as well as in many parts of the Eastern Province and in the north generally, it is common in spots which suit its habits. Near Trincomalie and in the Jaffna peninsula I found it more numerous than the last; along the west coast, and in the island of Manaar, as well as in the islands of Erinativoe, I likewise found it. Mr. Holdsworth records it as common at Aripu, and he procured it at Nuwara Elliya in October. It inhabits the eastern parts of the Kandyan Province, and finds its way to Hakgala and Nuwara Elliya from the Fort-Macdonald district.

On the mainland it has a very wide range. Captain Shelley thus epitomizes its habitat on the continent:—"India, northward to the Himalayas; westward it extends through Sindh and Baluchistan to the confines of Persia, and is possibly to be found in Southern Arabia. To the eastward it ranges through Assam, Tipperah, Chittagong, Arrakan, Burmah, and Tenasserim, but in this direction has not been collected southward of the river Yé."

As regards its *locale* in the Himalayas, Mr. Hume has obtained it far into the range "in the valley of the Beas, almost at the foot of the Rohtung pass, in the valley of the Sutlej as far as Chini, in the valley of the Ganges, or rather Bhagirati, to within four or five marches of Gangaotri;" but eastward of this he did not observe it at any distance from the plains. Blyth states that it arrives at Calcutta in the cool season, and leaves that district before breeding-time; he considered it (J. A. S. B. xii. p. 978) to be only a summer visitant to Nepal. Mr. Hume found it common all over Sindh; and in Kattiawar it is, according to Capt. Lloyd, abundant. In the Mount-Aboo district Capt. Butler found it common both on the hills and in the plains. Mr. Ball gives the like testimony concerning Chota Nagpur. Dr. Fairbank found it abundant in the vicinity of Khandala, and "common at the base of the Palanis and on the plains." In the Nilghiris it is numerous, and breeds, according to Mr. Morgan, as high as 6000 feet. In open jungle near the foot of the Travancore hills it, according to Mr. Bourdillon, "occurs abundantly." It is found in Ramisserum Island; and I may here remark that in perusing Mr. Hume's article on the avifauna of that group ('Stray Feathers,' 1876, p. 458), Captain Shelley has misread this locality for the Laccadive Islands, in which it does *not* appear to occur.

Mr. Blanford met with his short-billed variety near the Mekran coast, and remarks that "it is very

probably confined to Baluchistan and the low portion of Fars, in Southern Persia, perhaps ranging along the north-east coast of the Persian Gulf; but it has not been obtained in the neighbourhood of Bushire or Shiraz." He goes on to say that near Maskat, in Arabia, he saw a *Nectarinia* which may have been this species. In Tenasserim Mr. Davison says it occurs from Pahpoon to about Yea, the most southerly point where he ever observed it being about a day's march north of the river Yea.

Habits.—This beautiful species has very similar habits to the last; but it does not seem to frequent large trees as much. It is very lively in its actions, fluttering and poising itself over flowers while it extracts the nectar from them, and is constantly giving out its sharp but not unpleasant little chirping notes; its song in the breeding-season is not so loud nor so varied as that of its larger relative. It feeds on small flies and insects, especially spiders, as well as honey; and it is constantly opening and closing its wings, both when flitting about the branches in search of food and when singing in a state of rest on some prominent twig. Blyth remarks that he has taken so large a spider from its stomach that he wondered how it could have been swallowed.

Out of the breeding-season I have observed that the male birds associate together in little troops, and they may be seen in a variety of different plumages while moulting.

Nidification.—In the south of the island the Purple Sun-bird breeds in April, May, and June, but in the north it nests as late as August. In this month Mr. Holdsworth writes of a nest being constructed in the verandah of his bungalow at Aripu:—"It was fastened," he says, "to the end of an iron rod hanging from the roof and once used for suspending a lamp. The birds showed very little fear, although I was for several days sitting within a few feet of the nest, engaged in the preparation of specimens." The nest is generally suspended from the outspreading branches of a shrub or from the lateral down-hanging boughs of small trees; it is, like the last described, made of grass interwoven with hairs and covered often with spiders' webs; it is pear-shaped, tapering to the point of suspension, and with the opening near the top and shaded with a little hood which projects slightly; the interior is lined with cotton and feathers. Layard, in referring to the nest being artfully concealed with cobweb, writes that he has "seen the spider still weaving her toils, having extended the web to the surrounding branches, thus rendering the deception still more effective; and it would seem that the birds were aware of it and left their helper undisturbed." In his exhaustive article on the nesting of this Sun-bird Mr. Hume thus describes the construction of the nest:—"A little above the centre of the oval a small circular aperture is worked, and just above it a projecting cornice, 1 to $1\frac{1}{2}$ inch wide, is extended; then—on the opposite side of the oval—the wall of the nest, which is ready some days before the eggs are laid, is pushed or bulged out a little so as to give room for the sitting bird's tail. The bulging out of the back of the nest is one of the last portions of the work, and the female may be seen going in and out, trying the fit, over and over again. When sitting, the little head is just peeping out of the hole under the awning." Nests which are not built in a perpendicular direction appear not to be provided with this hood or awning. We gather from the article in question that the nest is constructed in the most varied situations, as, indeed, Mr. Holdsworth's experience in Ceylon proves. In India verandahs seem to be frequently chosen; and consequently, being so much under observation, few birds have had so much written concerning their nesting habits. Mr. Adam observes that they are very fond of tacking on pieces of paper, light-coloured feathers, &c. to the outside of the nest, and that, in one instance in which he watched the construction of a nest, the male "never assisted the female in the slightest degree; he seemed exceedingly happy, fluttered every now and then about the nest, and after each careful inspection he was so seemingly pleased with the handiwork of his mate that he perched on an adjoining branch and poured forth a joyous strain, flapping his wings and making his axillary feathers rotate in the most extraordinary manner." Two is the usual number of eggs, but sometimes three are laid; the ground-colour is greenish white, and they are closely marked with small specks of brownish and greyish brown; these markings are generally almost confluent at the large end. Mr. Hume gives the average size of fifty eggs as 0·64 by 0·46 inch.

CINNYRIS ZEYLONICUS.

(CEYLONESE SUN-BIRD.)

Certhia zeylonica, Linn. Syst. Nat. i. p. 188, "Ceylon" (1766).

Cinnyris zeylonicus (L.), Bonap. Consp. Gen. Av. i. p. 409; Shelley, Monogr. Cinnyr. pt. i. (1876); Hume, Str. Feath. 1877, p. 270; Fairbank, *t. c.* p. 398.

Nectarinia zeylonica (L.), Jard. Monogr. Sun-birds, pp. 213, 261, pl. 20 (1843); Blyth, Cat. B. Mus. A. S. B. p. 226 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 174; Gould, B. of Asia, pt. xix. pl. 4 (1867).

Leptocoma zeylonica (L.), Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 740 (1856); Jerdon, B. of Ind. i. p. 368; Hume, Nests and Eggs, i. p. 147 (1873); Ball, Str. Feath. 1874, p. 396; Legge, Ibis, 1875, p. 275.

Nectarophila zeylonica (L.), Walden, Ibis, 1870, p. 37; Holdsw. P. Z. S. 1872, p. 434; Morgan, Ibis, 1875, p. 315.

Cinnyris zeylonica, Davidson & Wender, Str. Feath. 1878, vii. p. 79.

Ceylonese Creeper, Latham; *The Amethyst-rumped Honeysucker*, Jerdon; *Humming-bird* of Europeans.

Mal sutika, lit. "Flower Honey-bird," Sinhalese; *Than-kudi*, lit. "Honey-feeder," Ceylonese Tamils.

Adult male. Total length 4·1 to 4·5 inches; wing 2·05 to 2·15; tail 1·35; tarsus 0·6; middle toe and claw 0·45 to 0·48; bill from gape across to tip 0·64 to 0·7. Some hill-specimens are more robust than those I have obtained in the low country, but do not measure larger in the bill.

Iris red and variable in tint from brick-colour to vermilion; legs and feet black.

Head above to the nape, together with the point of wing, brilliant metallic green; hind neck and its sides, upper back, scapulars, and a band across the chest deep maroon-red, the feathers at the origin of the scapulars metallic bronze; lower back, rump, and upper tail-coverts brilliant amethystine purple; wings brown, edged, except on the outer primaries, with dull ferruginous red; tail dull black, the lateral feathers with pale tips; chin, throat, and cheeks metallic purple-bronze; beneath, from the maroon pectoral band, primrose-yellow, paling to white on the flanks and under wing-coverts; under tail-coverts washed with yellow.

Some specimens have the green of the head tinted with amethystine (the centre portion of the feather being of this colour), and the amethystine of the rump glossed with brilliant metallic steel-blue; some specimens, again, have the two outer tail-feathers tipped whiter than others.

Female. Total length 3·95 inches; wing 2·0; bill, gape to tip (straight) 0·65.

Iris brick-red, in some as intense as in the male; bill, legs, and feet blackish brown.

Upper surface greyish brown, washed with greenish on the back; wings edged with duller rufous than in the male: a pale supercilium; chin and throat greyish white; breast washed with yellow; two outer pairs of rectrices tipped white.

Young (nestling: coll. Shelley, India). Bill 4·6 inches across arc to tip; wing 1·65.

Head and back olivaceous brown; a faint light supercilium; wings plain brown, the secondaries faintly edged with yellowish brown; longer upper tail-coverts and tail blackish, the outermost feathers smoky white, the next two tipped with the same colour; beneath primrose-yellow, tinted with greenish; the throat albescent.

Young male. "Similar to the adult female, excepting that it is less ashy above and slightly more olive-brown in colour: the eyebrows yellowish; chin, throat, and under tail-coverts sulphur-yellow." (*Shelley*, Monogr.)

Obs. I much neglected the collecting of these beautiful birds while in Ceylon, their lovely plumage, as far as I was concerned, generally ensuring their safety! I therefore procured no very young birds; but, in addition to the fact

that Jerdon affirms the throat of the young male to be more yellow than that of the female, Captain Shelley states, in his excellent article on this species, that the specimen labelled "Juv. ♂, Malabar," from which he took his description, had "one metallic-coloured feather on the throat, indicating that it would have assumed the adult male plumage." It is certainly a very interesting character in its plumage that the young male should only differ from the female in the colour of the throat being yellow. I myself obtained a specimen in August which had a metallic throat mingled with yellow feathers; the plumage of the head and back was mixed with dove-grey feathers, but the amethyst rump was not. I take this bird to have been changing to the adult stage from immature plumage. Indian birds have the bill longer, and are slightly larger than Ceylonese, but do not differ from the latter in the character of their plumage.

Males in Captain Shelley's collection measure 2·15, 2·2, 2·23, 2·25 in the wing; bill from gape across to tip 0·72, 0·75, 0·65, 0·68. In some the bills are more curved than in my specimens, in others slightly straighter.

Distribution.—The "Ceylonese Sun-bird" is a very abundant species with us; it is found throughout the whole island, but is particularly numerous in the western, southern, and lower parts of the Kandyan Province. About Colombo it is one of the most familiar of Ceylon birds, but it likewise frequents the forests of the interior, and its numbers do not seem to diminish towards the north. I found it tolerably plentiful in the Jaffna peninsula; but Mr. Holdsworth did not meet with it at Aripu, the country, perhaps, there being of too arid a nature for it; it occurs, however, in the south-east of the island, a district inhabited by other typical northern-province birds—*Pyrrhulauda grisea, Munia malabarica, Merops swinhoii*, and others; and it is, no doubt, only locally absent from the neighbourhood of Aripu. It inhabits the Trincomalie and Batticoloa districts, and is found throughout the northern forest tract. At Uswewa, in the Puttalam forests, Mr. Parker says it is common; and adjoining this section of country I have met with it in the Seven Korales. In the north-east monsoon season it ascends to the vicinity of the Nuwara-Elliya plateau, occurring not unfrequently in the Hakgala gardens. I did not see it at Nuwara Elliya; but I have no doubt that it may occasionally be seen, as a cool-season visitant, in the gardens of the residents there.

Concerning its distribution in India I cannot do better than subjoin here Mr. Hume's note on the subject which he published (Str. Feath. 1877, p. 270) in reference to Capt. Shelley's article (*loc. cit.*):—"It may generally be stated that this species is confined to Southern and Eastern India. It does not occur, as far as we know, in Sindh, Kutch, Kattiawar, Rajpootana, the Punjab, the North-west Provinces, Oudh, Behar, the Central Indian Agency, nor in the major portion of the Central Provinces, though in these latter it has been observed occasionally near Chanda, and is common in the Raipoor and Sumbulpoor districts. It does not extend to any part of British Burmah. It is normally a bird of the heavier rainfall and better-wooded provinces, though it certainly occurs in the comparatively dry uplands of the Deccan. It never ascends any of the mountain-ranges, to the best of our belief, to any considerable elevation, but is essentially a bird of the plains country. With this reservation its range may be said to include Travancore, Cochin, the whole Madras Presidency, Mysore, Hyderabad, the Bombay Presidency south of 20° N. lat., the southern portions of Behar, and the Central Provinces to about the same latitude, Raipoor, and the eastern states of these provinces, Orissa, the tributary Mehals, Chota Nagpur, and Lower Bengal, west of the Burrumpooter. I have never seen it from any of the districts east of this, *i. e.* Chittagong, Cachar, Tipperah, or Sylhet, though at Dacca, immediately west of this river, it is common. Nor have I seen it from Assam, though said to occur there, and though Godwin-Austen records a specimen from the Khasya hills."

Mr. Bourdillon does not appear to have noticed it in the Travancore hills, and the Rev. Dr. Fairbank only obtained it at the eastern base of the Palanis; yet it is common at no inconsiderable elevations in Ceylon.

Habits.—There is no more beautiful occupant of the bungalow-grounds, which make the environs of Colombo so pretty, than this lovely little creature. Attired in a plumage rivalling in splendour the gorgeous dress of the Humming-birds of South America and the West Indies, it may well be styled a "Humming-bird" by European residents in Ceylon. On almost every fine morning of the year it may be seen coming to the verandahs of the houses in the cinnamon-gardens, where it gathers nectar from the flowers which hang from the trellis-work, or snaps up the ill-starred spider as he diligently draws out his silken web in the rays of the morning sun; in other grounds equally pleasant, but not provided with such a favourite resort as these luxuriant creepers, it may be observed darting about among the handsome *Hibiscus*-shrubs, its metallic-plumaged

head and back glistening in the powerful sunlight, and exciting, perhaps, the warm admiration of some "new arrival" from England, who, rising from the morning tea-table, seeks the luxury of a pipe in the welcome long chair of eastern climes. But it frequents a variety of situations; it may be found in the tallest primeval forest or on the borders of isolated woods hung with creepers, in the flowers of which it finds the same sustenance as in the bungalow compound. Besides feeding on nectar it is very partial to small insects of all sorts; and, out of the breeding-season, flocks of young birds, and perhaps females, may be seen searching among the branches of forest-trees for food, unaccompanied by a single metallic-plumaged bird. At such times I have more than once, when I had left behind my binoculars, dropped specimens with a charge of dust-shot from the upper boughs of some noble keena-tree in the southern forests, or from an equally magnificent "koombok" overhanging the broad sandy bed of an eastern-province stream, and, expecting to pick up either of the much-sought-after "Flowerpeckers" of the island, been disappointed at finding that the little troop consisted of nothing but these Sun-birds. Had I taken the trouble to carry home some of these examples, my collection would have doubtless been enriched by the acquisition of birds in immature plumage. The song of this species is a lively pretty little chirping, which it constantly utters with a raising and shutting of its wings.

The males are most pugnacious; and, bearing on this point, Layard has an interesting note on the habits of this and the other Sun-birds of Ceylon; he writes (*loc. cit.*), after speaking of their visits to his verandah, "they would then betake themselves to the trellis supporting the passion-flowers, or to the branches of a pomegranate close by, where they pruned themselves and uttered a pleasing song. If two happened to come to the same flower, and from their numbers this often occurred, a battle always ensued, which ended in the vanquished bird retreating from the spot with shrill piping cries, while the conqueror would take up his position upon a flower or stem, and swinging his little body to and fro, till his coat of burnished steel gleamed and glistened in the sun, pour out his note of triumph. All this time the wings were expanded and closed alternately, every jerk of the body in *Nectarinia asiatica* and *N. lotenia* disclosing the brilliant yellow plumelets on either side of the breast."

Nidification.—The breeding-season lasts from November until July, during which time probably two broods are raised. I have taken the eggs in the north in November and in the south in December. The nest is a beautiful little structure, purse-shaped, and about 5 inches in length by 3 in breadth, and is attached to a pendent twig of a thorny shrub, generally about 4 or 5 feet from the ground. The exterior is composed of various materials, nests differing much in external appearance. They are generally constructed of fine grass or moss, decorated with small pieces of twig, bark, or decaying wood, which are fastened on with cobwebs and interlaced with lichens, white mosses, and such like—one nest, found near the shore of a salt lake, being covered with small pieces of bleached weed collected from the dry mud on the shore. The opening into the interior, which is composed of fine cotton, and sometimes strengthened with very fine grass, is just above the centre and shaded with a tiny hood; the depth of the egg-chamber is about 2 inches, and the diameter $1\frac{1}{4}$. The eggs are usually two, but sometimes three in number; large for the bird, rather stumpy ovals in shape, and of a dingy whitish or pale greenish or greenish-white ground, freckled with fine spots of greenish or olive-brown, which are often confluent round the obtuse end, and underlaid with small blotches of a lighter hue. The average dimensions are about 0·63 inch in length by 0·48 inch in breadth.

From 'Nests and Eggs' we glean that in India the breeding-season lasts from February until August, and that two broods are reared. The nest is constructed of the same materials as in Ceylon—vegetable fibres, cobwebs, chips of bark, dry petals of flowers, moss, cocoons, &c., and the interior felted with cotton-down. It is built sometimes as high as 30 feet from the ground.

The average size of the eggs is stated to be 0·65 inch by 0·47.

CINNYRIS MINIMUS.

(THE TINY SUN-BIRD.)

Cinnyris minima, Sykes, P. Z. S. 1832, p. 99; Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. p. 226.

Nectarinia minima (Sykes), Blyth, Cat. B. Mus. A. S. B. p. 226 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 175.

Nectarinia minuta, Jard. Mongr. Sun-birds, pp. 224, 265, fig. titlepage (1843).

Nectarina minuta (errore), Kelaart, Prodromus, Cat. p. 119 (1852).

Nectarophila minima (Sykes), Walden, Ibis, 1870, p. 40; Holdsw. P. Z. S. 1872, p. 434.

Leptocoma minima, Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 472; Jerdon, B. of Ind. i. p. 369 (1863); Hume, Nests and Eggs, i. p. 150 (1873); Fairbank, Str. Feath. 1876, p. 265; Bourdillon & Hume, *t. c.* p. 392.

Cinnyris minimus, Shelley, Mongr. Cinnyr. pt. iv. (1877); Fairbank, Str. Feath. 1877, p. 398.

The Tiny Honeysucker, Jerdon, B. of India.

Adult male (Travancore). "Length 3·5 to 3·7 inches; wing 1·8 to 1·81, expanse 5·37 to 5·62; tail 1·0 to 1·1; tarsus 0·48 to 0·5." (*Hume.*)
Iris brown (light hazel, *Fairbank*); bill, legs, and feet black.

Adult male. "Forehead and crown metallic green; lores, cheeks, and ear-coverts black; back and sides of the neck, upper back, scapulars, and least and median series of wing-coverts dark red; lower back, rump, and upper tail-coverts bright red, strongly glossed with steel-blue, making these parts in certain lights appear rich metallic lilac; remainder of the wings and tail brownish black; chin and throat metallic lilac; crop and front of the chest dark red; remainder of the breast, abdomen, thighs, and under tail-coverts yellowish white; pectoral tufts sulphur-yellow; under wing-coverts and inner margins of the quills white." (*Shelley.*)

In *non-breeding plumage* Messrs. Hume and Davison state that the males assume the garb of the female, except that they "retain invariably the amethystine-glossed rump, and usually a little red about the shoulder of the wing." A male in this stage in Captain Shelley's collection measures:—wing 1·9 inch; tail 1·2; tarsus 0·5; middle toe with its claw 0·4; bill across arc to tip 0·52.

Head, hind neck, and interscapular region brownish olive, brightest on the forehead and crown; lower back, scapulars, tips of lesser wing-coverts, and rump rich maroon-red; upper tail-coverts the same, but brighter and illumined with metallic lilac; wings deep brown; tail black-brown; beneath from the chin to the under tail-coverts primrose-yellow, with a dusky wash across the chest.

Adult female. Wing 1·75 inch.
Above with the wing-coverts olive-brown, like the male in non-breeding plumage; wings dark brown; the primaries edged pale; rump and upper tail-coverts dull maroon-red; tail blackish brown, edged with fulvous-brown; beneath pale yellowish.

Young male. "Differs from the adult male in having the upper half of the head and neck olive, and the entire underparts very pale yellow." (*Shelley.*)

Obs. I quote the following interesting information from Messrs. Hume and Davison's notes to Capt. Shelley respecting the change of the male to the non-breeding dress, and from which it will appear that the female attire is donned for a short time only:—"About April some of the males begin to doff the brilliant nuptial plumage; early in May some may be obtained in full non-breeding plumage; but during May some may still be obtained in the nuptial garb. In June most of the birds have assumed the complete non-breeding dress; but a few will still be found that have only partially moulted. After the first of July not a bird is to be seen in the nuptial dress. During September they begin to assume their wedding garb; by the end of that month a good many males are in perfect plumage; and by the middle of October every bird is in the gay nuptial attire."

Distribution.—The only records which we have of the occurrence of this lovely little bird in Ceylon are contained in the catalogues of Messrs. Layard and Holdsworth. The former says *Nectarinia zeylonica* is replaced in the north by *N. minima*, and the latter states that it "is occasionally seen about Colombo." For my own part I searched diligently for it the whole time I was in the island, but never saw it and never met with any one who was acquainted with it. It does not certainly occur in the Trincomalie district, and on two visits to Jaffna I failed to observe it; so that I am led to believe that Layard, when he used the word north, referred to Pt. Pedro, where he resided. I have not visited Pt. Pedro; but in other parts of the Jaffna peninsula I found the last species common enough. My friends Messrs. F. Gordon and W. Murray, who have both collected much in Jaffna, have never met with it to my knowledge; and up till the receipt of my latest advices it had not been obtained at Colombo by any one since I left the island in 1877. It is therefore strange that Layard found it so common as to replace *C. zeylonicus* in the north. Its occurrence in Ceylon is one of the many points which require attention at the hands of naturalists in Ceylon.

Messrs. Hume and Davison state that it is common in all the hilly tracts of the peninsula, in the Ghâts, as at Matheran (above Bombay), and Mahabaleshwar, all over the Nilghiris, in the Wynaad, and the hills of South Travancore. In this latter locality Mr. Bourdillon found it common at the edges of forest; and Dr. Fairbank observed it from 4000 feet to the top of the Palanis; he likewise records it from the western slopes of the Ghâts at Khandala, Mahabaleshwar, and the Goa frontier.

Habits.—From the writings of naturalists in India we gather some information of considerable interest touching the economy of the Tiny Sun-bird. Mr. Bourdillon remarks as follows :—"It is slightly gregarious in habit, three or four hunting about together amongst the boughs of some gamboge-tree, which is a tree they seem particularly to like. They are not at all shy, and when sitting quiet in brushwood I have seen them perch inquisitively within a few feet of my face." The following interesting account is from the notes supplied to Capt. Shelley by the writers already mentioned :—

"Though not strictly migratory, this species moves about a great deal; and though there are places in the Neilgherries, at elevations of 5000 or 6000 feet, where some may be seen at all seasons of the year, the mass of them move higher in summer, and descend a great deal lower in the winter. Thus in the Chinchona plantations at Neddivuttum, at an elevation of about 6000 feet, some specimens may be seen at all seasons; but it is not till the first burst of the south-west monsoon, between the 10th and 15th of June, that a single bird is to be seen higher up at Ootacamund. After this they swarm in every garden where there are flowers, and especially about the apple-blossoms of the orchards. By the end of October they have all left Ootacamund, and have descended to a lower level, while, again, in January and February they abound at the base of the hills, as in the Moyar valley, in the Wynaad.

"They are very restless, active little birds, hopping about ceaselessly from twig to twig and flower to flower, and using their legs probably more than their wings, keeping up all the time a soft uninterrupted *chip, chip, chip*; very rarely, if ever, are they seen poised Humming-bird-like in front of any flower. So far as our observations go they always perch to feed, and probably feed quite as much on insects as on nectar. They may be often found in low brushwood, especially in the thickets of the wild raspberry and along the outskirts of all the sholas, or strips of jungle which run down every ravine on the hill-side. About the Chinchona plantations they are so numerous when the trees are in flower in November, you might probably shoot a dozen specimens any morning off a single tree."

Nidification.—Mr. Davison writes to Mr. Hume ('Nest and Eggs,' 1874, p. 150) that the Tiny Honey-sucker breeds on the slopes of the Nilghiris in September and during the early part of October. "I have seen," he says, "young birds only just able to fly about the middle of October. The nest is suspended to a twig about 4 or 5 feet from the ground; it is similar both in shape and materials to that of *Leptocoma zeylonica*, but considerably smaller. They lay two eggs." Mr. Hume describes the eggs as "perfect miniatures of some of the eggs of *Arachnechthra asiatica*; in shape they are somewhat elongated ovals, a good deal compressed towards one end. They have scarcely any gloss. The ground-colour is dull greenish or greyish white, and it is thickly speckled and mottled all over, mostly so towards the larger end (where the spots have a tendency to become confluent and form a zone), with dull greyish white and olivaceous brown. The eggs measure 0·62 by 0·42 inch."

PASSERES.

Series B. Tanagroid Passeres.

Wing with 9 primaries, the 1st of which is fully developed and very long.
(*Cf.* Wallace, Ibis, 1874, p. 410.)

Fam. DICÆIDÆ.

Bill variable, moderately short and wide at the base; curved and compressed in some, in others very thick and triangular, with the lower mandible inflated at the gonys. Wings pointed, with the 1st quill long. Tail of 12 feathers, usually very short, always less than the wings. Legs and feet strong. Tarsus scaled.

Of small size and of arboreal and mostly gregarious habit.

Genus DICÆUM.

Bill high and wide at the base, suddenly compressed beyond the nostrils, the upper mandible curved throughout, tip entire and very acute; gonys straight. Nostrils basal, oval, and placed close beneath the culmen. Wings with the 1st, 2nd, and 3rd quills nearly equal and longest. Tail very short and even at the tip. Tarsus longer than the middle toe and claw, and shielded with broad transverse scales; outer toe slightly longer than the inner; hind toe and claw large.

DICÆUM MINIMUM.

(TICKELL'S FLOWERPECKER.)

Nectarinia minima, Tickell, J. A. S. B. 1833, ii. p. 577.

Dicæum minimum (Tick.), Blyth, Cat. B. Mus. A. S. B. p. 227 (1849); Jerdon, B. of Ind. i. p. 374 (1862); Beavan, Ibis, 1865, p. 416; Holdsw. P. Z. S. 1872, p. 434; Hume, Nests and Eggs, p. 155 (1873); Ball, Str. Feath. 1874, p. 397; Legge, Ibis, 1875, p. 275; Fairbank, Str. Feath. 1876, p. 256.

Dicæum tickelliæ, Blyth, J. A. S. B. 1843, xii. p. 983.

Dicæum tickelli, Kelaart, Prodromus, Cat. p. 119 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 175.

"*Parasite-bird*," Europeans in Ceylon. *Sungti-pro-pho*, Lepchas (Jerdon).

Adult male. Length 3·4 inches; wing 1·85 to 1·95; tail 0·95; tarsus 0·45 to 0·5; middle toe and claw 0·4: bill to gape 0·45.

Female. Length 3·3 inches; wing 1·7 to 1·75.

Iris yellowish brown or brown; bill dark brown above, the lower mandible fleshy; legs and feet brownish slate.

Above olivaceous brown, slightly greenish on the rump; wings brown, the coverts and tertials with slightly paler margins; tail blackish brown; lores and cheeks albescent, darkening on the ear-coverts; beneath whitish, with a

dusky wash on the sides of the chest, and becoming flavescent on the centre of the breast and belly; flanks cinereous.

In some examples the secondaries are edged with olivaceous.

Young. Iris darker brown than in the adult, with a slaty outer circle; upper mandible tinged with yellowish, and its margin, together with the under mandible, yellowish.

Above more olivaceous than old birds; quills and wing-coverts edged greenish; throat and fore neck duskier than in adults.

Obs. I have not been able to compare Ceylonese examples with many from the mainland. A specimen in the national collection, marked "India," measures 1·95 inch in the wing, and 0·41 from gape of bill to tip. It is somewhat more olive-coloured on the back and rump than my specimens, but corresponds otherwise with them.

An allied species to this is *D. concolor* from South India, an inhabitant of the Nilghiris and other peninsular ranges. It is larger than *D. minimum*, and is, according to Jerdon, more albescent beneath. Dr. Fairbank remarks that it frequents a parasitical *Loranthus* which grows on the Australian Blackwood (*Acacia melanoxylon*), and gives the measurements of a female as follows:—Length 3·6, wing 2·1, tail 1·0, tarsus 0·55, bill from gape 0·5. This species might possibly occur in Ceylon. These Flowerpeckers are seldom shot, and it may have been passed over.

I should perhaps likewise notice another species described of late years from the Andamans, belonging to the subgroup containing the two species already referred to here. This is *D. virescens*, Hume (Str. Feath. 1873, p. 482). It "differs from *D. minimum* in its somewhat longer bill, which is very differently coloured, in the much greener hue of the upper surface, and in the olive-yellow tinge of the rump, upper tail-coverts, and abdomen. It is considerably smaller than *D. concolor*, is of a purer and lighter olive-green, and differs from that, as from *D. minimum*, in the rump and upper tail-coverts. Length 3·1 to 3·4 inches, wing 1·75 to 1·85."

Distribution.—This tiny bird is very numerous in Ceylon, and inhabits the whole island, irrespective of climate or elevation. It seems as much at home in the damp cool jungles of the Horton Plains as in the hot forests of the Northern Province or the warm humid "Mukalaney" of the south. It is found as plentifully near the sea as in the interior, and is very common in the cinnamon-gardens of Colombo.

It occurs, according to Jerdon, "throughout lower Bengal and the jungles of Central India, extending to the Himalayas, Assam, and Arakan. Blyth observed it in extreme abundance in the hill-jungles about Moulmein. It is also found, though rarely, in Southern India, being there replaced by *D. concolor*."

As it is so abundant in Ceylon, it is strange that it should be rare in the adjoining part of the mainland; but in this respect it, after all, only forms one of the many curious instances of the affinity of the avifaunas of Ceylon and Northern India. The Rev. Dr. Fairbank found it common on the western slopes of the Sahyadris, and near Bombay and Poona it is, according to Mr. B. Aitken, very numerous. Mr. Ball remarks that it is found in Sal-jungle in most parts of Chota Nagpur, though it is not very common anywhere. Captain Beavan recorded it as plentiful near Maunbhoom in the breeding-season.

Habits.—This Flowerpecker, which is the smallest of Ceylon birds, frequents the parasitic plants (*Loranthus*?) which grow on various trees throughout the island, none of which are so infested with this singular vegetable growth as the Cadju (*Sarcoclinium longifolium*). It may consequently always be met with where there are many of these trees, about the leaves and smaller branches of which it flits when it is not gorging itself on the berries of the parasite. In the forests it affects the various creepers, some of them of the *Pandanus* tribe, which entwine the trunks of large trees. It is usually a solitary bird; I have sometimes seen more than two in the same tree, but such is an exception to the rule. It is very active, springing from branch to branch of the thick bunches of parasitic plants, and then darting off to another tree with a quick dipping flight, uttering its sharp little monosyllabic chirp while on the wing. It appears, from personal observation, to be entirely frugivorous; and feeding so gluttonously on its favourite berries, it becomes stupefied to such an extent that it may sometimes be almost taken with the hand before flying off. Its bill is generally stained with the juice of some sort of berry or fruit whenever it is shot; and I have never detected any trace of insect-food in the crop of those I have procured. It is, however, said by Indian writers to be insectivorous; for Beavan writes (*loc. cit.*), "It has a weak piping note, and is met with in heavy jungle, in thick trees, busily engaged seeking amongst the leaves for insects."

Nidification.—The breeding-season in the Western Province, as well as I can ascertain, is in July and August; but the nests are so rarely found (Mr. MacVicar, of the Survey Department, and a very successful egg-hunter, being, I believe, the only person who has discovered it) that it would not be safe, with so little evidence in the matter, to restrict the season to any particular month. This gentleman, who found one nest in August containing three young birds, described it to me as being a beautiful little cup-shaped structure, suspended, about 7 or 8 feet from the ground, to the twig of a Cadju-tree, constructed of wild cotton, mingled with cobwebs and lichens, and about $1\frac{1}{2}''$ in interior diameter. Subsequently he writes me of having found another, which was hanging to the branch of a wild cinnamon-bush growing in a fence. This one was formed outside of "some soft substance like tow, with a few pieces of bark and some spiders' webs; the inside was entirely lined with white 'cotton.' It measured 4 inches in length and $2\frac{1}{4}$ in breadth, external dimensions." It contained an egg, on which the bird was sitting when the nest was found, and which is stated to be white, speckled with minute brownish specks. In India, Messrs. Beavan and Aitken have both taken the nests and eggs, and describe the latter as white. I am, notwithstanding, sure that my informant, who knows the bird too well to mistake it, is right in his identification of the speckled egg just noticed. Mr. Hume thus speaks of the nest found by Mr. Aitkin, "It is a beautiful little 'egg,' suspended by the pointed end (which is slightly, and only slightly, extended) from the point of junction of three slender twigs. The length of the nest is exactly 3 inches, the greatest breadth 1·7 inch. In front, from near the point of suspension to the middle of the nest, is an oval aperture 1·25 inch in length and nearly 1 inch in breadth. The whole nest is composed of the silky pappus of some asteraceous plant, or it may be of the silky down of the *Calotropis,* held together by a slender irregular webwork of vegetable fibres, in which here and there a very few minute fragments of the exereta of caterpillars and tiny pieces of bark and fine grass have been, perhaps accidentally, intermingled. . . . . The whole interior is soft, silky, felted down." Captain Beavan remarks that three pure white eggs brought to him measured 0·6 by 0·4 inch.

Genus PACHYGLOSSA.

Bill short and very stout, both high and wide at the base; culmen curved considerably; tip faintly notched, but not serrated; gonys deep and curved up to the tip. Nostrils linear, in a capacious membrane, and partly protected by a tuft; gape with minute bristles. Wing long; the 2nd quill the longest, the 1st slightly shorter and subequal to the 3rd, 4th slightly shorter than the 1st. Tail short and even. Legs and feet stout; the tarsus covered with obsolete transverse scales; anterior toes joined at the base, the outermost syndactyle; inner toe slightly shorter than the outer; hind toe and claw large.

[illegible]
ZOSTEROPS CEYLONENSIS

PACHYGLOSSA VINCENS.

(LEGGE'S FLOWERPECKER.)

(Peculiar to Ceylon.)

Prionochilus vincens, Sclater, P. Z. S. 1872, p. 729; Holdsw. *t. c.* p. 483; Legge, J. A. S. (Ceylon Branch) 1873, p. 13; Sclater, Ibis, 1874, p. 2, pl. 1; Legge, *t. c.* p. 23; Holdsw. *t. c.* p. 126; Hume, Str. Feath. 1875, p. 493 (redescription).

♂ *ad.* suprà plumbeus indigotico nitens, uropygio clariùs plumbescenti-cinereo: tectricibus alarum secundariisque nigris, dorsi colore marginatis: remigibus rectricibusque nigris, his (duabus mediis exceptis) albo terminaliter maculatis, externis latiùs: facie laterali totâ et colli lateribus pileo concoloribus: gulâ et præpectore albis: corpore reliquo subtùs flavo, hypochondriis vix olivaceo lavatis: tibiis et subcaudalibus albis, flavo lavatis: subalaribus albis: remigibus infrà nigris, intùs albo marginatis.

♀ *ad.* mari similis, sed pallidior et suprà minùs nitens: dorso olivaceo lavato: tectricibus alarum quoque nigricantibus, olivaceo vix marginatis.

Adult male. Length 4·1 to 4·2 inches; wing 2·3 to 2·4; tail 1·2; tarsus 0·5; middle toe and claw 0·52; bill to gape 0·45. Iris reddish; bill black, lower mandible pale at the base; legs and feet blackish brown.

Head, hind neck, back, rump, and lesser wing-coverts dull steel-blue, palest on the rump, and with the concealed portion of the feathers dark; wings and tail blackish, the coverts and tertials edged with the hue of the back, the secondaries edged faintly towards the tips with bluish green; terminal portion of the three outer tail-feathers white, tip of the next pair the same; throat and chest white, changing into saffron-yellow on the breast and lower parts, and paling to yellowish on the under tail-coverts; under wing-coverts and basal portion of the inner webs of the quills white. In specimens in abraded plumage the rump assumes a whitish aspect.

Female. Length 3·9 to 4·1 inches; wing 2·15 to 2·3; bill somewhat lighter than that of the male; iris not so intense: legs and feet slightly paler.

Head and hind neck bluish ashen, changing into the olivaceous brown of the back, which is overcome with dark olivaceous green on the lower back and rump; wings paler than in the male, coverts edged with olivaceous; tail brownish black, the terminal spots less deep and confined to the three outer pairs of rectrices; breast much less bright than in the male, with the flanks cinereous.

Young. Males of the year are very similar to adults; the breast not so yellow. Iris brown or red-brown. Females have the iris in nestling plumage olive-brown, changing when older to reddish brown; bill with the base of lower mandible yellowish fleshy. Above dull greenish brown, changing to dull brown on the sides of the neck and face, the white of the chin and throat confined to the centre; sides of chest cinereous, under surface washed with yellow.

Obs. This species was classed by Dr. Sclater as a *Prionochilus*, a genus of Strickland's, instituted for the reception, as this gentleman tells us ('Ibis,' 1874, p. 1), of the birds described and figured in the 'Planches Coloriées' of Temminck as *Pardalotus percussus*, *P. thoracicus*, and another Malayan species, *P. maculatus*. This group is characterized by minute serrations on the upper mandible, and hence the name—πρίων, a saw, and χεῖλος, a lip. They have likewise, as Mr. Wallace states in his note on the genus ('Ibis,' 1874, p. 411) and also writes me recently, a minute 1st primary. On again examining the Ceylonese bird and carefully comparing it with a closely allied congener from Nepal, *Pachyglossa melanoxantha* (Jerdon, B. of Ind. i. p. 378), I find that these serrations are not present in either, and in addition to this they possess but *nine primaries*, which at once precludes their being placed with the *Prionochili*. This latter genus, according to the system of classification followed in this work, would be located in the Sturnoid Passeres, while *Pachyglossa*, to which the Ceylonese form belongs (it being a congener of the Nepal species), must be placed among the Dicæidæ in the Tanagroid or nine-primary section of the Passeres. I have lately sent my specimens to Mr. Wallace for examination, in order to obtain the benefit of his valuable opinion; and he writes me that my bird being a decided *Pachyglossa*, this genus will now consist of three species—*P. aureolimbata* (a beautiful species described by himself from Northern Celebes), *P. melanoxantha* from Nepal, and *P. vincens* from Ceylon.

P. melanoxantha (figured in 'The Ibis,' 1874, pl. 1) is a rare species and larger than *P. vincens*, measuring in the wing 2·80 inches: the proportion of the quills differs slightly from that of the Ceylonese bird, the 1st quill being slightly shorter. The coloration is much the same as regards its distribution; but the sides of the throat are blackish slate, contracting the white into a broad stripe; the under tail-coverts also are yellow, like the breast and abdomen.

Distribution.—When this little bird was brought to the notice of the scientific world by Dr. Sclater in the 'Proceedings of the Zoological Society' in 1872, the credit of its discovery was given to myself, as the specimens which I had sent him from the south of Ceylon were considered to be the first ever procured. Mr. Hugh Cuming, however, a well-known collector of Ceylonese birds, had, as noticed by Mr. Holdsworth in 'The Ibis' for 1874, brought home a male of this species, which was, I conclude, overlooked among the skins acquired from him by the British Museum, and was not identified until after its rediscovery by myself nearly thirty years afterwards. I am glad, therefore, to be able to give the true history of its discovery to my Ceylon readers, and ensure the credit of it being given to Mr. Cuming.

It is, as far as we know, essentially a bird of the heavy rainfall districts. My first specimens were procured in 1871 in the Kottowe forest near Galle, where it is abundant. I subsequently found it in other jungles adjacent to this one, in the fine timber-reserves near Oodogamma, on the south bank of the Gindurah, and in the Kukkul Korale, more particularly in the Singha-Rajah or Lion-king forest. Thence northward its range extends into Saffragam, where I obtained it in the Kuruwite Korale, in the lower Peak jungles, and saw it even as far north as Avisawella. Mr. Bligh shot, in 1873, a fair number of specimens in Kotmalie, to which district, lying at the base of the western slopes of the main range, it must extend through Maskeliya and Dimbulla, in both of which valleys it will doubtless some day be found. Its habitat is, I suspect, limited to the damp forest region, consisting of the south-west of the island, the southern coffee-districts, Saffragam, and the western portion of the Central Province as above indicated. It may perhaps be found in Uva, but will not, I should say, extend into the low country of the Eastern Province.

Habits.—I subjoin here the following extract from my notes on this Flowerpecker contained in the Journal of the Ceylon Branch of the Asiatic Society for 1873:—"It dwells exclusively in high jungle (the 'Mukalaney' of the Sinhalese), and affects the leaves and smaller branches of moderately sized trees, but more particularly the luxurious creeper *Freycinetia angustifolia*, a species of *Pandanus*, which grows so plentifully in the southern forests, entwining and clothing the stately trunks so completely that they have, in the distance, the appearance of ivy-clad columns. It associates in small flocks, which, when this plant is in fruit, may be seen feeding on its seeds. Its movements are most active, now hovering for an instant over a flower, now clinging 'tit-like' to the underside of some chosen sprig. . . . Although it usually takes but short flights in the jungle, from tree to tree, its powers of locomotion are considerable, and at times it may be seen darting across openings in the forest from one belt to another. Its note is a weak *tze-tze-tze*, somewhat resembling that of the Long-tailed Tit of Europe (*Acredula caudata*), and which is scarcely audible on a stormy day amidst the soughing of the wind through the forest trees. It is generally uttered in concert by the flock when searching together for food." I observed that in the Singha-Rajah forest it frequented the flowers of the Bowittiya plant (*Osbeckia virgata*), but whether in search of insects or not I was unable to ascertain. The stomachs of nearly all the specimens I have procured contained succulent matter, evidently extracted from fruit and seeds; and I therefore suspect that it is almost entirely frugivorous. It does not always confine itself to low situations in the forests, for I have met with it in flocks frequenting the tops of the loftiest trees in the Oodogamma timber-jungles.

The breeding-season, I imagine, must be during the south-west monsoon, for the organs of examples killed in both June and August testified to their nidification being carried on during that period. It is probable that this bird builds somewhat similarly to its Nepalese congener, which, says Hodgson, "makes an ingenious pendulous nest."

The figures in the Plate accompanying this article are those of a male and female from the southern forests.

Genus PIPRISOMA.

Bill very short and wide at the base, triangular when viewed from above, compressed suddenly beyond the nostrils; culmen keeled and compressed between the nostrils, below which the margin is inflated; gonys very deep, ascending and keeled near the tip. Nostrils very small. Wings long; the 1st quill equal to or slightly less than the 2nd and 3rd, which are the longest; 4th equal to the 1st. Tail short, even at the tip, not exceeding the closed wing by more than the length of the middle toe. Tarsus longer than the middle toe and claw; toes rather slender, hind toe moderately long; claws stout and well curved.

PIPRISOMA AGILE.

(THE THICK-BILLED FLOWERPECKER.)

Fringilla agilis, Tickell, J. A. S. B. 1833, ii. p. 578.

Pipra squalida, Burton, P. Z. S. 1836, p. 113.

Piprisoma agile, Blyth, J. A. S. B. 1844, xiii. p. 314; id. Cat. B. Mus. A. S. B. p. 228 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 262; Jerdon, B. of Ind. ii. p. 376 (1863); Beavan, Ibis, 1865, p. 416; Blyth, Ibis, 1866, p. 365; Beavan, ibid. 1867, p. 430, pl. x.; Jerdon, Ibis, 1872, p. 18; Holdsw. P. Z. S. 1872, p. 434; Hume, Nests and Eggs, p. 158 (1873); id. Str. Feath. 1873, p. 434; Ball, ibid. 1874, p. 397, et 1878, vii. p. 209.

Chitlu-jilta, Telugu (Jerdon).

Adult male and female. Length 3·9 to 4·0 inches; wing 2·15 to 2·3; tail 1·1; tarsus 0·48; middle toe and claw 0·4 to 0·45; bill to gape 0·4.

Iris orange, with an inner golden circle; bill plumbeous brown, lower mandible bluish; legs and feet plumbeous.

Above olivaceous brown, greenish on the rump and upper tail-coverts, and with the margins of the wings and tail the same; centres of the feathers on the forehead slightly darker than the margins; wings brown; tail blackish brown, narrowly tipped with white on all but the two outer tail-feathers, which have a terminal white spot; lores greyish; face and ear-coverts brownish; a rim of minute pale feathers on the eyelid; fore neck and under surface white,

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In Lesson's 'Century of Zoology' is figured (pl. 26) a very remarkable little bird, said to have been procured by a Dr. Reynard at Trincomalie, and named by Lesson *Prionochilus pipra*. The engraving certainly represents a bird belonging to this group of Flowerpeckers; but whether it is *Piprisoma*, *Pachyglossa*, or *Prionochilus* it is impossible to say. Lesson's description of this *rara avis* is in French, and could not be better translated than it has been by Blyth (notes on Ceylon ornithology, 'Ibis,' 1867, p. 306). I accordingly give it verbatim for the benefit of my readers:—"Upper parts brownish ashy; the wings and tail brown, with a russet tinge; throat and front of the neck rust-coloured; the rest of the lower parts brown, rayed (the feathers tipped in the figure) with whitish; vent and lower tail-coverts russet; *axillary tufts brilliant violet*; bill and tarsi black, the lower mandible whitish beneath. Length about 4 inches, the closed wing 2·25." The date given by the author for the publication of this note is April 1830. From that day to this the bird has never been heard of; and the extraordinary character of its plumage, exemplified in its possessing, in combination with an otherwise sombre dress, two brilliant axillary tufts like those of a Sun-bird, almost suggests the idea of a *made-up* bird!

The following is M. Lesson's note on the species:—"M. le Docteur Reynard a découvert cet oiseau à Trinquemalie sur la côte de Ceylon. Ses mœurs sont inconnues, et ses caractères mixtes porteraient sans doute à en faire un petit genre intermédiaire à ces des *Pardalotus* et des *Pipra*, si le genre Pardalote n'était pas lui-même peu caractérisé."

the sides of the chest and breast with dull olivaceous mesial stripes to the feathers; flanks olivaceous; bases of the under tail-coverts dark.

Some examples are less conspicuously striated beneath than others; and one from the Uva district is greener than those from the Northern Province.

Young male. "Length 3·9 inches; wing 2·2; tail 1·1; bill at front 0·3. Iris differing from that of the adult, yellowish brown, darkest near the pupil, and without the bright 'thread' or circle round it; bill brownish horny, tip of upper mandible black, lower mandible paler; legs and feet dark leaden" (*Parker*, in epist.). Described as being like the adult; the orbital rim of feathers "dull white, and the outermost tail-feathers much paler than the rest; the forehead with indications of striæ."

In a *young female* the terminal white spots on the lateral tail-feathers are almost absent.

Obs. In his paper on Ceylon birds (Str. Feath. 1873, p. 434) Mr. Hume calls attention to certain characteristics of Ceylon examples of this species, concerning which he remarks that "they have a much more decided green cast on the upper surface, especially on the rump and upper tail-coverts; they are slightly smaller, and the bills are a little shorter and somewhat less compressed towards the point." I have carefully noted these remarks and endeavoured to get together as large a series as possible for comparison; but skins of this little bird are by no means plentiful. I have examined four skins in the British Museum, two of which are from the North-west Himalayas, six of Mr. Ball's, and one of Mr. Elwes. The latter is from Saugor, Central Province, and Mr. Ball's skins are from Sambalpur, Satpura, and Talchin. The comparison of this small series with four Ceylon specimens tends to show that low-country Ceylon birds are smaller than Indian; but a hill example almost equals a Himalayan one. Two from this latter locality measure 2·4 and 2·45 inches. A Logole-oya (Uva) specimen measures 2·4. Sambalpur examples are as follows:—♀, wing 2·29; ♀, wing 2·38; ♀, wing 2·3; ♂, wing 2·4: Satpura, ♂, wing 2·3; Talchin, ♂, wing 2·4. In all these the wing is *slightly* more pointed than in the Ceylonese bird, the 1st quill usually almost equalling the 2nd, and in the others being a trifle shorter than it; in the Satpura specimen it is about $\frac{1}{20}$ inch less than the 2nd. The Ceylon specimens all vary in this respect, this feather in two falling short of the 2nd by nearly $\frac{1}{16}$. Were there, therefore, no variation in the continental birds our race might stand as a subspecies. With regard to the colour, the green of the Indian birds on the rump and upper tail-coverts is of a more yellow tinge than in the island race, which is characterized by its more olive tint. Newly moulted specimens are much brighter than birds in old feather. Males are greyer than females on the head. These several differences would appear on paper to have some weight; but on laying the two series of skins side by side I have been unable to separate them, the Ceylonese birds merely differing in that slight manner which one expects in such a small bird isolated somewhat from its fellows of the mainland.

Distribution.—This curious little bird, as far as it has yet been observed, seems to inhabit principally the midland portion of the northern forest tract. Layard obtained it on the Central road, and Mr. Parker, from whom I have received specimens, informs me that it is not uncommon at Madewatchiya and about Anaradjapura, and he has lately procured it at Uswewa in the month of July. I met with it in Uva, and obtained a specimen on the Logole oya at about 3000 feet elevation. It occurs, I believe, in the Kandy district, and would therefore appear to be scattered sparingly over a considerable portion of the island.

Jerdon writes of this bird, "It is found over the greater part of India, from the Himalayas to the Malabar coast. . . . . . . most commonly in jungle-districts; but it is also seen occasionally in groves of trees in bare country. I have procured it at Goomsoor, on the Eastern Ghâts, in Malabar, and the Deccan. Blyth obtained it in the Midnapore jungles." Captain Beavan remarks, "This bird cannot be considered common in Maunbhoom, although it is certainly tolerably abundant during the breeding-season." In Kumaon it was observed by Mr. Thompson, who spoke of it also as breeding at Ramnuggur, which is on the borders of the sub-Himalayan range.

Habits.—The Thick-billed Flowerpecker frequents the tops of trees in forest, searching about among leaves and small boughs for insects, after the manner of *Dicæum*. It is generally, according to my experience, solitary; but Mr. Parker shot one out of a troop of four or five in the Uswewa district. It feeds on spiders and minute insects; in Uva I noticed it frequenting small umbrageous trees overhanging a rocky stream in a glen. Jerdon remarks that it has a weak piping note and associates in small flocks; but Capt. Beavan testifies to the contrary, saying that he observed it alone, and says that its dull colours prevent its being seen. "Its note,"

he writes, "I should term a 'shrill' instead of a 'weak' piping, which can be heard at some distance, long before the bird itself is visible."

Nidification.—The present species breeds in India from the middle of February till the end of May, commencing, according to Mr. Hume, earlier in the plains than in the Himalayas. I imagine that in Ceylon it lays during the first three or four months in the year; but I have no certain data, beyond the fact of Mr. Parker shooting an immature specimen in June, and my own observations as to the old birds moulting in August. Its nest was beautifully figured in 'The Ibis' for 1867, together with the young birds, by Mr. Wolf, from specimens sent home by Captain Beavan. This naturalist writes ('Ibis,' 1865) as follows:—"The nest is very peculiar—a pocket-like structure suspended from a small bough which forms the roof, the entrance being from one side near the top. It is composed entirely of spiders' web and other silks, with which a pinkish-brown fluff (probably from some tree in flower) is felted together, making the nest look entirely of that colour. There is no lining; only the material employed is denser at the bottom than at the top of the nest. The great peculiarity is that the nest is as if woven in one piece, and, like a bit of cloth, can be shaken and compressed without doing it any injury. The length is 3 inches, breadth 2 inches; entrance-hole 1·5 inch long by 0·87 inch broad. The eggs are moderately elongated, of a light pink ground-colour, blotched indistinctly with pink spots, more frequent and massed at the obtuse end; they are large for the size of the bird, their length being 0·62 inch, and their breadth a little over 0·37 inch."

Mr. R. Thompson likewise writes to Mr. Hume:—"I obtained a nest of this bird at Ramnuggur, on the borders of the sub-Himalayan range, on the 12th May, which contained two eggs of a fleshy-white colour, thickly blotched with pinkish spots. The nest was a neat structure, pendent from a thin branch of a small leafless tree; it was entirely composed of the pubescent covering of the skins of a species of *Loranthus*, which the birds had scraped off, and, mixing with spiders' webs, had woven into a thin felt. The shape of the nest is that of a purse opening down the side." While taking another nest, he remarks that the old birds hovered about, and more than once perched close to his head. Writing from Modahpore, in March, he informs Mr. Hume that he "saw a couple fixing the foundation of their nest with cobwebs and the pubescent downy covering of the young shoots of *Butea frondosa*, which the birds bit off in small pieces and mixed with cobwebs, both birds at work alternating the time of arrival and departure with material."

From the above remarks it will be seen that this Flowerpecker constructs one of the most wonderful little nests known; indeed the editor of 'The Ibis' remarks that the one sent by Capt. Beavan was one of the most beautiful structures he had ever seen. Mr. Hume says two or three eggs are laid each time, and that he is inclined to believe that the birds have two broods at least in the year. The ground-colour varies from "rosy white to a decided pink, and the markings from brownish pink to claret-colour." They average in size 0·63 by 0·41 inch.

Genus ZOSTEROPS.

Bill somewhat curved, high and wide at the base, compressed towards the tip, which is obsoletely notched and very acute. Nostrils linear; a few rictal bristles. Wings with the 3rd quill exceeding the 2nd, which is longer than the 1st. Tail shorter than the wings, even at the tip. Tarsus longer than the middle toe and claw, and shielded with broad smooth scales; outer and middle toes slightly syndactyle, claws much curved. Eyes beset with a velvety fringe of white feathers.

ZOSTEROPS PALPEBROSA.

(THE COMMON WHITE-EYE.)

Sylvia palpebrosa, Temm. Pl. Col. 293. fig. 2 (1824).

Zosterops nicobaricus, Blyth, J. A. S. B. 1845, xiv. p. 563.

Zosterops palpebrosus, Blyth, J. A. S. B. 1846, xv. p. 44; id. Cat. B. Mus. A. S. B. p. 220 (1849); Kelaart, Prodromus, Cat. p. 121 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 267; Jerdon, B. of Ind. ii. p. 265 (1863); Legge, J. A. S. (Ceylon Branch) 1870–71, p. 52; Holdsw. P. Z. S. 1872, p. 458, pl. xx. fig. 1; Adam, Str. Feath. 1873, p. 384; Hume, Nests and Eggs, ii. p. 397 (1874); Ball, Str. Feath. 1874, p. 417; Legge, Ibis, 1874, p. 22; Walden, *t. c.* p. 143; Morgan, Ibis, 1875, p. 322; Hume, Str. Feath. 1875, p. 143; Brooks, *t. c.* p. 252; Butler & Hume, *t. c.* p. 491; Hume, ibid. 1876, p. 463; Fairbank, ibid. 1877, p. 407.

Zosterops nicobariensis, Hume, Str. Feath. 1874, p. 242, et 1876, p. 291.

The White-eyed Warbler, Latham; *The White-eyed Tit*, Jerdon; *The Zosterops* of some.

Adult male and female. Length 4·1 to 4·4 inches; wing 2·05 to 2·1; tail 1·5 to 1·6; tarsus 0·6 to 0·65; middle toe and claw 0·5; bill to gape 0·45 to 0·49.

Male. Iris (very variable) brownish olive or olive-grey, or grey mottled with brown, and often with a pale outer circle; bill blackish, bluish at base beneath; legs and feet slate-blue.

Above uniform yellowish green, slightly yellower on the upper tail-coverts and sides of neck, where it blends into the primrose-yellow of the chin, fore neck, and upper part of chest; wings and tail brown, edged with a slightly greener hue than the back; lores black, above which the feathers are yellowish; a deep orbital fringe of white feathers; beneath albescent, shaded with greyish on the sides of the upper breast and on the flanks; centre of belly with a faint yellowish wash; under tail-coverts and edge of wing yellow; under wing-coverts white; the loral spot varies in intensity, being blacker in birds which are in new feather than in others.

Female. Iris often tinged with reddish. I have myself only noticed this peculiarity in this sex; it may exist in the other.

Obs. Mr. Holdsworth remarks (*loc. cit.*) that specimens from the low country vary in size; I have found this to be the case as regards bulk, but not in the wing to any extent. Indian specimens have the grey of the flanks spreading more over the under surface than Ceylonese; they vary, however, in this respect, and the exceptions to the rule correspond too well with our birds to admit of any separation of the latter. The coloration of the upper surface and the throat are the same in both forms. As regards size, six examples in the national collection from various parts of India vary in the wing from 2·0 to 2·1 inches; one from Nilghiris, wing 2·05, tail 1·6 (this is paler beneath than some of the above-mentioned, but darker above); one from Tenasserim, wing 2·1, slightly darker than the Ceylonese examples; one from Nepal, wing 2·0; one from Darjiling, wing 1·95; four from

North-west Himalayas, wing 2·1 to 2·25. These data show that the species varies in size somewhat, the largest specimens, as may be expected, inhabiting the Himalayas. A Nicobar-Islands example has the upper surface of a darker green than most Indian ones, and possesses a well-defined pale superloral stripe, with the black of the lores passing under the eye. There are several closely-allied species of this genus; among them *Zosterops simplex*, Swinhoe, from China, is not distantly related to *Z. palpebrosa*; and *Z. buxtoni*, Nicholson (Ibis, 1879, p. 167), from Java, is a miniature of our bird, the back greener, the tail darker, the black of the lores passing under the eye, and the wings tinged with grey; throat and under surface as in *Z. palpebrosa*; wing 1·9 to 1·95.

Distribution.—The Common Zosterops, or White-eye, is a very numerous bird in Ceylon, and is more or less scattered over the whole of the low country, ascending likewise into the hilly regions to an altitude of about 3500 feet. In the Western Province and south-west it is particularly numerous, both on the seaboard and in the interior; but in the northern half of the island it appears to prefer the inland districts, for I always found it less abundant along the north-east coast than in the central forests; in these latter, however, it is local, and, like most other birds, comes much more into notice in one part than in another. It is common in the woods of the Eastern Province and in the jungles to the south of the Haputale ranges. In the mountainous country formed by the Morowak and Kolonna Korales I noticed it chiefly at the borders of forests, and in the Kandyan Province it is partial to the sparsely-timbered patnas in the wide valleys which are drained by the affluents of the Mahawelliganga; thus in the Pusselawa, Hewahette, Deltota, and other districts, as well as in that of Badulla, it is fairly common.

On the mainland it has a wide range, being found in various localities throughout the whole of India to the sub-Himalayan regions, and extends thence into Assam, Burmah, and probably to Tenasserim, in which province its presence is doubtfully recorded in 'Stray Feathers' by Mr. Hume. In the extreme south it is a common bird, being found both at the base and the summit of the Palanis, and also on the tops of the Nilghiri hills, where Jerdon remarks that it exists in great abundance. It therefore ascends to a greater altitude in the peninsula than in Ceylon. It likewise occurs in the Northern Ghâts, is common throughout the wooded portions of the Deccan, sparingly distributed in Chota Nagpur, rare in the Sambhur-Lake district, where Adam says he has only once seen it, and further west still is locally diffused, being common at Mount Aboo, but not found in the plains adjacent to it. Mr. Hume writes, "I have never seen it in or from Cutch or Sindh, nor have I specimens from Kattiawar; but Captain Hayes Lloyd reports it as common there, probably as pertaining to the Girwar region." It is found near Mussoori, and along the slopes of the Himalayas eastward; in Pegu it is likewise well known. Its *universal distribution throughout the Laccadives* is singular. Mr. Hume writes, "The White-eyed Tit is the one resident land-bird of the group; it occurs in every inhabited island that we touched at." The Andaman and Nicobar islands also come within its range, the representatives of the species there being somewhat different from continental birds, inasmuch as they appear, as a rule, to have longer bills and to be of a somewhat greener shade on the upper surface (the peculiarities of one example are noticed above). They were originally separated by Blyth as *Z. nicobarica*; but Mr. Hume considers that though they might form a variety of the true *Z. palpebrosa*, they cannot well be separated entirely.

Habits.—This little bird is most sociable in its proclivities, frequenting the leafy boughs and tops of trees in woods and forests, either in large flocks or smaller parties of a dozen or more. It searches about the leaves and blossoms of trees in flower, and feeds on insects, seeds, and buds; it is restless in its manners, the whole flock moving about in consort and uttering perpetually a plaintive monosyllabic whistle. On windy days it is more on the move than at other times, and its tiny note is heard above the roar of the storm in the forest more plainly than the louder voice of other birds. It is partial to the jack, bread-fruit, "tulip," and other trees growing about native villages; and in the afternoon, after its appetite has been appeased, little troops of four or five may be seen sitting huddled together on dead branches of, or bare twigs in, those umbrageous trees. At certain times of the year I have seen it in the Suriah-trees in the fort of Colombo, to which it is no doubt attracted when they are in flower. Although this White-eye partakes of insects, its diet is, for the most part, frugivorous, the consequence of which is that it is very destructive to gardens, picking off the buds of fruit-trees, as well as attacking the fruit itself. I have known caged individuals in England feed with avidity on dried figs.

Mr. Ball writes of the pluck which he observed these little birds display in the Satpura hills in attacking the Rose-Finch, a vastly more powerful bird, and driving it away from the flowers of the Mhowa (*Bassia latifolia*), which, he remarks, forms a favourite hunting-ground of this "Tit." In the gardens on the Nilghiris, Jerdon says it may be seen clinging to the flower-stalks and "extracting the minute insects that infest flowers, by the pollen of which its forehead is often powdered."

Nidification.—The White-eye breeds in June, July, and August, attaching its neat little nest to the horizontal fork of a small or moderately-sized tree, sometimes at a height of 20 feet from the ground, or suspending it between the twigs or branches of a small bush at a few feet from the soil. It is a frail but seemingly strong little work, made of fine tendrils of creepers, moss-roots, thin grass-stalks, and a little moss, carefully interwoven, and at the upper edges worked round the supporting twigs; the exterior is often mixed with pieces of seed-down, cotton, cocoons, &c., some of which substances are generally used for the lining of the interior as well; this is about $1\frac{3}{4}$ inch in diameter and is rather shallow. Mr. Morgan writes that it builds in the south of India a pretty little cup-shaped nest of golden-coloured moss and thistle-down lined with silk-cotton; he describes the eggs as being two or three in number and of an exceedingly pale blue colour, measuring in length 0·71 inch and in breadth 0·51. Some that I have examined were pale greenish blue and pointed at the small end.

In Mr. Hume's 'Nests and Eggs' will be found much interesting matter concerning the nesting of this White-eye in India, among which Captain Hutton tells us that the little oval cup is so slight and so frail "that it is astonishing the mere weight of the parent does not bring it to the ground; and yet within it three young ones will often safely outride a gale that will bring the weightier nests of Jays and Thrushes to the ground." The majority of the nests taken by him were composed of "little bits of green moss, cotton, and seed-down, and the silk of the wild mulberry-moth torn from the cocoons."

ZOSTEROPS CEYLONENSIS.

(THE CEYLONESE WHITE-EYE.)

(Peculiar to Ceylon.)

Zosterops annulosus, Kelaart, Prodromus, Cat. p. 121 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 267; Legge, J. A. S. (Ceylon Branch) 1870–71, p. 29.

Zosterops ceylonensis, Holdsw. P. Z. S. 1872, p. 459, pl. xx. fig. 2; Swinhoe, Ibis, 1873, p. 228; Layard, P. Z. S. 1873, p. 205; Legge, Ibis, 1874, p. 22; Holdsw. *t. c.* p. 123; Legge, Ibis, 1875, p. 410.

The Mountain Bush-creeper, Kelaart; *The Hill White-eye*, Europeans in Ceylon.

Suprà flavicanti-viridis, loris et plumis supra- et infraocularibus saturatè cinereis: annulo ophthalmico albo: tectricibus alarum dorso concoloribus: remigibus et rectricibus nigricanti-brunneis, dorsi colore marginatis: gutture toto et præpectore lætè flavis: corpore reliquo subtùs albido, pectore flavicanti-viridi lavato, lateribus hypochondriisque delicatè cinerascentibus: tibiis, crisso subcaudalibusque lætè flavis: rostro nigricante, ad basin schistaceo: pedibus plumbeis: iride brunnescenti-flavâ.

Adult male and female. Length 4·5 to 4·7 inches; wing 2·1 to 2·3; tail 1·6 to 1·75; tarsus 0·7; middle toe and claw 0·5 to 0·55; bill to gape 0·57 to 0·63.

Iris yellowish brown, or reddish brown, or pale brownish yellow (as variable as the last species); bill blackish, with the base beneath bluish or pale slaty; legs and feet bluish or pale leaden.

Above dusky olive-green, somewhat infuscated on the forehead and pale on the rump: wings and tail brown, edged with the hue of the back; a close, white, orbital fringe, as in the last species; lores, just beneath the eye, and from the gape down the side of the throat blackish; this gular streak varies in size and intensity; throat and fore neck pale greenish yellow, shading off into the green of the side neck; breast and lower parts albescent, shaded with greyish on the sides, and with a wash of yellowish down the centre of the breast; thighs and under tail-coverts greenish yellow; under wing-coverts whitish.

Females have the yellow of the throat greener, as a rule, than males, and appear, as in the common species, to have the eye reddish at times.

Obs. Although this species has long been known as a Ceylonese bird, it is only lately that it has been discriminated as new to science. Kelaart and Layard assigned to it the specific appellation of *annulosus*, which in reality was the name given by Swainson to an African species figured in his 'Zoological Illustrations.' The former, in writing of it as a Nuwara-Elliya bird, said ('Prodromus,' p. 102), "We fear that the Nuwara-Elliya *Zosterops* is wrongly identified: it is of a darker green than the common *Zosterops palpebrosus*;" he accordingly styled it, in his catalogue, by the above-mentioned name, which was likewise used by Layard*, who, however, doubted its distinctness from the low-country bird. In 1869 Mr. Holdsworth and myself examined specimens in the Asiatic Society's Museum, which he had presented to that institution, and but little doubt remained in our minds that it was a good species: in November of the following year I read a note on it at a Meeting of the Ceylon Branch of the Asiatic Society, and had the intention of giving it a name in my paper to be published in the Journal, p. 29 (1870–71); in the mean time, however, Mr. Holdsworth, who had taken up the subject more fully, informed me that he had worked it out, and was about to call it *Zosterops ceylonensis* in his paper in the 'Proceedings of the Zoological Society,' and I accordingly expunged my description from the Asiatic Society's Journal. It has been maintained by some that there is a *Zosterops* inhabiting the Nilghiris, which might be identical with the present species. Mr. Blanford called attention to this matter in the Journal of the Asiatic Society of Bengal, 1869, p. 170, in which he says that the Nilghiri race is "a little larger and appears to be darker in colour" than *Zosterops palpebrosa*. Mr. Swinhoe likewise writes, in 'The Ibis,' 1873, that he had a specimen from Captain Bulger's collection, marked "Madras,"

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* Layard writes me to correct a mistake which occurred in his note on this species (P. Z. S. 1873, p. 205). The last sentence should read:—" I have *not* collected in Nuwara Elliya."

which he had shown to Dr. Jerdon, and pointed out the differences between it and *palpebrosa*, and further remarks that it appeared close to *Z. ceylonensis* in size and colour, but had no more yellow on the neck than the ordinary species. Nothing, however, seems to have been further noted of this supposed species; and whatever it may be, I doubt not that it is different from our bird.

Distribution.—This White-eye is a very abundant species in the main range, especially on the Nuwara-Elliya plateau; it is, however, numerous in all the circumjacent coffee-districts, down to about 3000 feet, and likewise in the Haputale, Badulla, and Madulsima ranges; beyond the valley of Dumbara it frequents the upper parts of the Knuckles and the east and west Matale hills. In Maskelya it is common, and in the Peak forests I met with it in great abundance down to an elevation of 2000 feet. On the south side of the great valley of Saffragam it reappears and inhabits the coffee-districts of the Kolonna, Kukkul, and Morowak Korales, and ranges thence into the subsidiary hill forests between the upper part of the Gindurah river and Galle. Here I found it, as recorded in 'The Ibis,' 1874, on the summits of the Opaté and Oodogamma hills, as low down as 1500 feet, which is the least elevation at which I have observed it. It would be interesting to know whether it inhabits the isolated Muneragala range, which stands out in the low country beyond the slopes of the Passara and Lunugala hills, and is quite disconnected from them.

Habits.—The Hill White-eye frequents both the interior and the edges of forest, patna-jungle, underwood, and low bushes in open places near woods and so forth, affecting the lateral branches of tall trees, the tops of smaller ones, and the foliage of shrubs and undergrowth. It has no partiality for any situation in particular, but consorting in very large flocks, where insect life abounds, the birds composing them may be found both high up and low down in their leafy haunts, little parties clinging to the twigs of the smallest bushes, others searching the branches of saplings, while the foliage of the monarchs of the forest high overhead teems with dozens more, the whole concourse moving on by twos and threes in quick succession as the leaves are cleared of their insect-pests and all the tempting buds eagerly nipped off. It is seen much about the edges of paths in the jungle; and in such localities it exhibits an utter fearlessness of man, allowing so near an approach that I have often stopped to watch the movements of a pair feeding close to me, and been able to admire the handsome white eye-fringe as well as if I had had its tiny owner in my hand. Its principal note is a sparrow-like chirp, which it is particularly energetic in uttering when in large flocks.

Mr. Holdsworth writes of it:—"As these birds are very common, and constantly flying in small parties from bush to bush, uttering their lively chirp, they attract attention; and the little White-eye is familiar to most Europeans who visit Nuwara Elliya. In the winter the males associate in flocks of fifteen or twenty; and it is then rare to find a female in their company. I believe the latter are for the time solitary, as, with one exception, the numerous specimens I have shot from different flocks have proved to be males." In the months of December and January I have seen *hundreds* in a flock in the Nuwara-Elliya jungles.

Nidification.—This species breeds from March until May, judging from the young birds which are seen abroad about the latter month. Mr. Bligh found the nest in March on Catton Estate. It was built in a coffee-bush a few feet from the ground, and was a rather frail structure, suspended from the arms of a small fork formed by one bare twig crossing another. In shape it was a shallow cup, well made of small roots and bents, lined with hair-like tendrils of moss, and was adorned about the exterior with a few cobwebs and a little moss. The eggs were three in number, pointed ovals, and of a pale bluish-green ground-colour. They measured, on the average, 0·64 by 0·45 inch.

On the Plate accompanying my article on *Pachyglossa vincens* will be found a figure of the present species.

PASSERES.

Fam. HIRUNDINIDÆ*.

Bill short, very broad at the base, triangular when viewed from above; flattened, straight, the culmen gently curved at the tip, which is entire; gape smooth and very wide. Wings long and pointed, the first two quills longer than the third; the secondaries very short. Tail of 12 feathers, variable in shape and length. Legs and feet weak; tarsus short, generally bare, and covered with smooth scales, in some feathered.

Genus HIRUNDO.

Bill typical in shape, compressed near the tip. The nostrils basal, elongated and exposed, placed in a depression near the culmen. Wings with the 1st quill equal to or longer than the 2nd. Tail long and deeply forked. Tarsus equal to the middle toe, and shielded in front with *smooth* broad scutes. Middle toe much longer than the lateral ones, which are subequal; hind toe moderately large.

HIRUNDO RUSTICA.

(THE COMMON SWALLOW.)

Hirundo rustica, Linn. Syst. Nat. i. p. 343 (1766); Blyth, Cat. Mus. A. S. B. p. 197 (1849); Jerdon, B. of Ind. i. p. 157 (1862); Sharpe & Dresser, P. Z. S. 1870, p. 244; Holdsw. P. Z. S. 1872, p. 418; Shelley, B. of Egypt, p. 120 (1872); Hume, Nests and Eggs. i. p. 72 (1873); id. Str. Feath. 1874, p. 154 (Andamans); Salvadori, Ucc. Born. p. 125 (1874); Dresser, B. of Europe, pt. 39 (1875); Irby, B. of Gibraltar, p. 103 (1875); Legge, Ibis, 1875, p. 275.

Hirundo panayana, Gmel. Syst. Nat. i. p. 1018 (1788); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 91 (1854).

Hirundo gutturalis, Scop. Delic. Flor. et Faun. Insubr. ii. p. 96 (1786); Kelaart, Prodromus, Cat. p. 118 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 170; Swinhoe, P. Z. S. 1871, p. 346.

* The Swallows are classed by Jerdon and other naturalists (Van der Hoeven, Kaup, &c.) with the Swifts; and, on account of their outward similarity to them, it is the popular belief that the two families are closely allied. No greater error, I think, could exist, although, as Mr. Wallace pithily remarks in a letter to me on the subject, "*they constitute the most remarkable case known of outward resemblance and real diversity*." The Swallow, in the formation of its sternum, legs, and foot, and in the structure of its wing, as also in the number of the tail-feathers, is strictly a *Passerine* bird. The Swift is a *Picariform* bird in its sternum and foot, which latter is most remarkable, all the toes being either directed forward, or the hind toe being reversible to the front. The bill is unlike that of a Swallow, resembling those of the Nightjars. Blyth, Huxley, and others hold the Swallow to be Passerine in all respects; the former, who took strong exception to what he styled Jerdon's antiquated notion of associating the two families, remarks (Ibis, 1866, p. 230):—"The Hirundinidæ illustrate and exemplify, even to the minutest detail, the special *passerine* type of conformation, which is merely modified externally to confer extraordinary vigour of wing." The hind toe, in some of the Sand-Martins, is said to have a tendency to reverse; this feature is not exemplified in the case of the two English species.

Hirundo jewan, Sykes, P. Z. S. 1832, p. 83.

The Panayan Swallow and *Javan Swallow* (Lath.); *The Chimney-Swallow*, popularly in England; *Golondrina*, *Oroneta*, Spain (Saunders); *Andorinha*, Portuguese; *Zwaluw*, Dutch; *Ababil*, Hind.; *Talli illedi kuravi*, lit. "Bird without a head," Tamul; *Wauna Kovela*, Telugu; *Paras pitta* of the Mharis (Jerdon); *Ui Karloghach*, Yarkandis (Scully); *Khotaifa*, Moorish (Irby); *Tāmm pādy*, Tamil; *Füsti Fecske*, Transylvania.

Wæhælaniya, lit. "Rain-fowl," Sinhalese.

Adult male (winter, Ceylon, 3 examples). Length 6·8 to 7·0; wing 4·5 to 4·7; tail 3·5 to 3·8; tarsus 0·4; middle toe and claw 0·6; bill to gape 0·55 to 0·6; depth of tail-fork 2·0 to 3·0.

Iris brown; bill, legs, and feet black.

Head and upper surface glossy blue-black; wings and tail dull black, the quills with a bluish tinge on the inner webs; the longer tail-feathers with a greenish lustre, and the shorter with a bluish one; all but the central rectrices with a large white spot, which, on the lateral pair, runs out to a point; forehead, chin, throat, and upper part of chest ferruginous chestnut, bounded beneath by a black interrupted pectoral band of variable width; under surface, under tail and under wing-coverts white, tinged on the sides of the breast and at the vent strongly with rufescent.

Female. Wing about 4·5 inches; lateral tail-feathers about 0·75 inch shorter than in the male.

Iris, bill, legs, and feet the same.

Differs from the male in having the under surface almost pure white.

Young (Krasnoyarsk, Siberia, July). Head brown, glossed with metallic green; front of the forehead sienna-red; back and rump blackish green, with a greyish hue; wings dark greenish brown, coverts glossed with green; chin and throat pale sienna, beneath which is a broad brown pectoral band, well defined above, but washed in the centre with sienna; beneath white, suffused with delicate reddish buff, the centre of the breast less so than the sides; flanks dusky; outer tail-feathers 0·9 longer than the central pair; wing 4·9 inches.

On growing older the sienna colour of the forehead fades, and is encroached upon by the black, and also the reddish hue of the under surface vanishes, while the red throat changes to buffy white. On arriving in Ceylon in October the yearling bird has the edge of the forehead only *rufescent greyish*, the throat rufescent white (specimens often exemplifying the change of colour in the feathers by patches of red and whitish), and the under surface whitish, with the pectoral band brown; the lateral feathers are still short and rounded at the tips. When leaving the island during the spring moult, the forehead and throat become rufous, the pectoral band becomes black, and the under surface in the males is suffused with buff.

Obs. The above descriptions relate to the Asiatic race of the Common Swallow which visits Ceylon. Old birds arrive in the island in much the same plumage in which they leave England in October, the under surface in the males being only tinged here and there with buff. A Hampshire specimen in my collection corresponds in this respect with one shot at Galle in October. I do not know whether, as a rule, they arrive at their breeding-haunts, after leaving Ceylon, with the under surface as much suffused with reddish as is the case with the males on their arrival in England; some Central-Asiatic summer examples I have seen exhibit this character, so that it is probable that the spring plumage on both continents is the same.

As the Swallow ranges eastward from Europe it has a tendency to become smaller, and to acquire a pectoral band more or less interrupted at the middle by the rufous colour of the throat, thus approaching the American form, *H. horreorum* (found, according to Mr. Dresser, beyond Lake Baikal), which is closely allied to the European species, and has the band merely in the form of a black patch on the sides of the chest, and the underparts rufescent or yellowish brown.

This incomplete banded and usually small Asiatic form is the *H. gutturalis* of Scopoli; and it is customary to class most Indian specimens of the Common Swallow under that name. Chinese specimens, *as a rule*, are typical, and so are those from Tenasserim (Hume, Str. Feath. 1878, p. 41). Seven adults in the Swinhoe collection vary in the wing from 4·4 to 4·6, and have the pectoral band incomplete. Our Ceylon birds belong to this form, but they are intermediate in size between it and the true *rustica*. I state this with reserve, as I have only a small series; but one young female measures nearly 4·5, and this is about the average size of Swinhoe's *adults*.

On the other hand it must not be supposed that all Asiatic specimens can be strictly classed with this smaller race; they vary exceedingly, some being large, with the characteristic European black pectoral band, and some equally

so, with the rufous-marked band; and it is this fact which prevents my considering *gutturalis* a good *species*; at the same time it cannot be denied that birds from certain districts do run small. Whether these are all bred in the same locality it would not be possible to say. The results of my examination of a series of skins are as follows:—I find some Siberian skins, and one from Amoy, with the band quite as black as some from England; and, as regards size, a Hampshire specimen, one from Siberia, and one from as far east as Formosa measure 4·85, 4·8, and 4·75 respectively, and all have the same *black* pectoral band. Several examples from Central Asia (Kardatchino, Sargaschino, &c.) are very large (wing 5·0), and have the black band much interrupted by the rufous colour of the throat. These latter have longer tails than any others which I have seen, the outer feathers in one example being 3·5 inches longer than the centre pair. Finally, Mr. Hume finds that in Sindh and Western India the Swallows are of the true *rustica* type, with a wing of 4·8 to 5·0 (many English specimens do not reach 4·8) and the tail 4·7 to 5·0. The inference, therefore, to be drawn from these data is that in Asia the Common Swallow varies in size and colouring in different districts of the continent, and that its several races either intermix or contain here and there birds typical of each other in such a manner that the Asiatic form cannot be considered a good species.

In Palestine and India there is a resident and closely allied species to the common Swallow, viz. *Hirundo savignii*, Stephens. This bird (which is the *H. cahirica*, Licht., of Canon Tristram, and *H. riocourii*, Audouin, of Shelley, 'Birds of Egypt') differs from the present species in having the under surface from the band downwards chestnut-red instead of whitish or buff as in the latter; the spots on the tail are rusty white instead of pure white. Canon Tristram remarks that this colour is constant, "neither fading nor intensifying" at any time of the year. "Specimens shot at all seasons are precisely similar" ('Ibis,' 1867, p. 361). This bird is reported to visit Europe and to breed with *H. rustica*; but Mr. Dresser is of opinion that brightly coloured examples of the latter species in spring plumage have been mistaken for it. Canon Tristram, in the same article, says that the two never interbreed in Palestine.

Hirundo tytleri (Jerdon, App. vol. iii. B. of India, p. 870) is an Indian member of this group of Swallows. It appears to be scarcely distinguishable, as regards its plumage, from *H. savignii*. The original description is, "Glossy black above, beneath dark ferruginous chestnut; form and size of *H. rustica*." It was discovered at Dacca, and appears to migrate to Pegu and Tenasserim, affecting the first-named province from July till May.

From Messrs. Sharpe and Dresser's researches (P. Z. S. 1870, and 'Birds of Europe') it would appear that the European Swallows undergo, as immature birds, the same changes which I have described above; they state that the sienna frontlet entirely disappears when the bird is in its winter plumage in South Africa, and that there is a mere indication of it by the presence of a few pale buff-coloured feathers. This is just as it is in Ceylon with our birds.

Distribution.—The Swallow arrives usually in the north of the island about the second or third week in September, the young birds coming in first. The period of its arrival is, however, somewhat irregular, and perhaps depends upon the break up of the south-west monsoon to some extent. Its numbers are increased considerably in about a fortnight after its first appearance, and it then begins to spread southward, but does not do so always as regularly as might be expected. Mr. Parker has observed it at Puttalam as early as the 20th September one year, when my earliest date noted down at Colombo was not till after the 1st of October. At other times I have seen it at Colombo in the middle of September, and I observed it at Galle in 1872 on the 15th of that month. It inhabits the whole of the low country, and likewise ascends into the hill-districts to a considerable elevation, but does not inhabit the higher regions in any abundance. It leaves the island completely about the second week in April, quitting the southern districts a week or two prior to that date. It is, I think, commoner on the west coast than on the east.

About the first week in August, according to Captain Butler, the Swallow arrives in the Mount-Aboo district, and leaves again as early as February; it soon spreads throughout India, but does not seem to visit all districts at the same time, for Captain Beavan writes that they visit Maunbhoom in January and leave quite by the end of February. In the Andamans, according to Messrs. Hume and Davison, they do not disappear until May, from which I gather that the birds inhabiting those islands (although Mr. Hume, when writing of them in 1874, considered them identical with the English bird) must belong to the *gutturalis* type which visits Tenasserim, and which migrates in a different direction to those which inhabit Western India. Not a few breed along the Himalayas from 4000 to 7000 feet, while still more remain in Cashmere for that purpose, and Captain Hutton found them nesting abundantly at Candahar. On the plains of Eastern Turkestan Dr. Scully says they arrive (from the south I conclude) about the middle of April, breeding there

in May and June. Thence northward it is found throughout the vast extent of Central Asia and Siberia from west to east (except perhaps in the north-east of Siberia and Kamtchatka), and ranges above the 60th parallel of latitude. It inhabits all China and Formosa in summer; and Mr. Dresser says that there is a specimen in the Cambridge Museum from the Philippines, thus extending its range very far to the eastward. Dr. Meyer, in his "Field-notes from Celebes," records it from Menado, Tello (South Celebes), and likewise from the Togian Islands. It also visits Java, Sumatra, Borneo, Batchian, and Morty Island.

Migrating to the north from Africa it spreads in the spring through the whole of Europe, passing through Egypt, according to Captain Shelley, from the south in April. Further west, however, its advent in Europe is much earlier; for we find Col. Irby recording it as passing over from Tangier, where some remain to breed, in January and February; and Mr. Howard Saunders was informed that it usually arrived at Malaga on the 25th of the former month. It must remain, however, in Spain for some time before venturing into more northerly climes, as we seldom see it in England before the middle of April. The migratory stream from the south of Africa, where the Swallow winters in great numbers, continues to flow for some months after these Tangier birds commence to move. I saw it in considerable force at St. Vincent on the 15th of April, 1877; and Governor Ussher ('Ibis,' 1874, p. 62) obtained specimens in complete plumage in February and March at Cape Coast, Western Africa, and noticed that it left the Gold Coast before the 1st of May. Mr. Godman found it breeding abundantly in Madeira and the Canaries, but is unable to say whether it is stationary there; other observers remark that it only occurs on passage in the Canaries. In Teneriffe it arrives after the Swift. In Sardinia, according to Mr. A. B. Brooke, "it arrives in small numbers about the end of February or early in March, from which time they keep gradually increasing in numbers. Young birds were hatched about the 29th of May." Not content with overspreading the temperate parts of Europe, it perseveres in its onward journey to the very northern coasts, and thence further even to the shores of Nova Zembla, and even to Spitzbergen, it having been seen there by Mr. Arthur Campbell's exploring party in 1874. It is a rare straggler to Iceland, and has never yet been known to occur in Greenland.

Concerning its return to winter quarters in Africa, we find that some remain throughout the season in the northern part. Mr. Tyrwhitt Drake says that it is seen all the year round in Tangier and Eastern Morocco, so that it both breeds and winters there. Captain Shelley likewise considers that it may be resident in Egypt to a small extent, as he obtained an immature specimen on the 28th February; but the fact that it was abundant in Nubia in May is, I think, still more conclusive that it breeds in North-eastern Africa and doubtless remains throughout the year. Some examples would appear to remain in South Africa during the winter, or to return very early from breeding-grounds in the north of the continent; for Layard saw one on the 27th of July at Cape Town, and again another on the 30th August; this latter, he remarks, was probably a new arrival from the north.

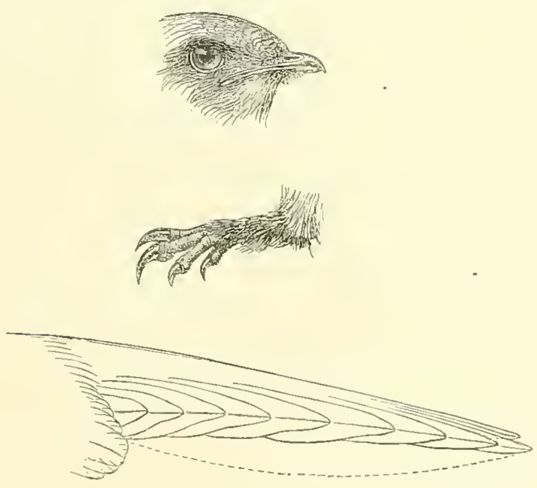
Habits.—Much might be written concerning the habits of the favourite harbinger of our English spring; but they are well known to the most casual observer, and my space will not permit of any lengthened dissertation on the economy of this interesting bird. Of late years, since the climate of old England has undergone such changes, the saying that "one Swallow does not make a summer" is disagreeably true; but, nevertheless, the first welcome sight of the sweet bird, its shining plumage illumined by the fitful sunbeams of a chilly April day, conduces to the hope that soon the bitter east wind will have blown itself out, and that Nature must speedily array herself in that joyous verdant attire which makes the warm English May-day so inexpressibly lovely. To the resident in Ceylon the Swallow brings no such pleasant prospect; it arrives in the midst of the wind and rain with which the south-west monsoon dies out, and foretells nothing but the usual dry Christmas weather of this part of the tropics. Yet its presence on the Galle Face at Colombo, as it skims along just above the turf on a bright though windy morning, or sits in rows of a dozen or more twittering its winter notes on the telegraph-wires at noon, is not without a charm, and reminds one of the home that has been left behind far beyond the western horizon. The time and place, however, in which to see the Swallow to perfection is when it is careering over a beautiful English lawn on a bright June morning, sweeping round the handsome conifers and beneath the spreading oaks; or when, glancing out of some rustic barn, it darts like a polished arrow down the tiny brook or round the village green in search of a mouthful for the little brood so snugly housed against yonder beam. In Ceylon we miss the pretty little chattering song of the male in the

breeding-season, although it does commence it before leaving in March. Scores of these birds may be seen perched on the telegraph-wire crossing the "Lotus-pond" at Colombo, a spot which furnishes a never-failing supply of insects; and they may frequently, as in other countries, be observed seated on roofs or on some little eminence on the ground. As is the case in England, before leaving the island they collect in flocks, but of much fewer numbers, as there are no young birds to congregate together. Few birds enjoy such an immunity from persecution as the Swallow; it is rarely shot except by those who are really in want of skins for scientific purposes. Favier has an interesting note with reference to the Moors and the Swallow; he says "the Moors believe it offends God to kill these birds; in the same way they believe it pleases or soothes the Evil One to kill the Raven. The stories on which this superstition is founded are too long to relate; but I was informed by one person that the Swallow and White Storks were inspired by Allah to protect the harvest and the country from noxious insects and reptiles, and that the birds themselves (knowing the benefits they confer on man) ask in return protection for their offspring by building their nests on the walls of towns and houses."

Nidification.—In India and on its northern confines (the only region we have to do with, as regards its nesting, in this work) the Swallow breeds during May and June. To the south of the Himalayas it breeds along the whole chain, from Cabool to Assam, at from 4000 to 7000 feet; it has been known to nest at Simla, Murree, Darjiling, Dhurumsalla, and at Asaloo on the Naga hills, in which latter place Col. Godwin-Austen observed it. In Turkestan, according to Dr. Scully, it makes a mud nest on the roofs of houses, the number of eggs laid being three or four.

The Swallow's nest is familiar to every Englishman; made of little pellets of mud brought by the birds in their mouths from the neighbouring brooks, ponds, or muddy roads, and fixed to the side of a beam or rafter, or against a wall, generally below the eaves, it is quite a work of art. It is very strong and durable; the very bottom foundation (as is only right and proper in architecture) is commenced first, the sides are then proceeded with, and then the bowed out part commenced and carefully worked at till the semicircle is complete. The interior is lined with a little grass and then with feathers, on which the eggs repose. The number of eggs is usually four, pure white, spotted all over with moderately sized specks, blotches, and spots of brownish red. Mr. Hume describes some taken in the Himalayas, where the bird builds in the corners of verandahs, as freckled and mottled all over with small specks of pale brownish red. The average size of seventeen eggs taken in India was 0·76 by 0·53 inch.

The subjoined woodcuts of the bill, wing, and foot of the Swift and of the Swallow will, I hope, illustrate to my non-scientific readers the distinguishing characters I have alluded to in this article. The wings are reduced, but the heads and feet are of the natural size.



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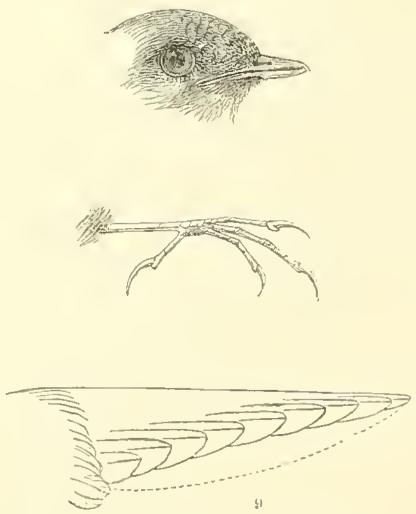
Swift (*Cypselus affinis*).



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Swallow (*Hirundo rustica*).

HIRUNDO HYPERYTHRA*.

(THE CEYLON SWALLOW.)

(Peculiar to Ceylon.)

Hirundo hyperythra (Layard), Blyth, J. A. S. B. 1849, xviii. p. 814; id. Cat. B. Mus. A. S. B. p. 198 (1849); Kelaart, Prodromus, Cat. p. 118 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 170; Blyth, Ibis, 1867, p. 306; Gould, B. of Asia, pt. xx. (1868); Holdsw. P. Z. S. 1872, p. 419; Legge, Ibis, 1874, p. 13, et 1875, p. 280.

Cecropis hyperythra, Jerdon, Ibis, 1871, p. 352; Hume, Str. Feath. 1877, p. 266.

The Red-bellied Swallow, Kelaart; *The Red-breasted Swallow.*

Wahalaniya, Sinhalese.

♂ *ad.* suprà purpurascenti-niger, interscapulio paullo fulvo vario, plumis basaliter et marginaliter fulvis: uropygio latè castaneo: alis caudâque cum supracaudalibus purpurascenti-nigris: loris pileo concoloribus, infrà castaneo variis: facie laterali et regione paroticâ saturatè castaneis, plumis obscurè purpurascenti striatis: corpore subtùs castaneo, gutture et pectore angustissimè nigro striolatis: subcaudalibus longioribus, purpurascenti-nigris: subalaribus pectori concoloribus: rostro nigro: pedibus vinascenti-brunneis: iride brunneâ.

Adult male and female. Length 6·5 to 6·8 inches; wing 4·6 to 4·9; tail 3·1 to 3·3, centre feathers 1·4 shorter than the external; tarsus 0·5 to 0·6; middle toe and claw 0·6; bill to gape 0·6.

Iris sepia-brown; bill deep brown, in some blackish, base of lower mandible reddish; legs and feet vinous brown.

Head, hind neck, back, scapulars, wing-coverts, and longer upper tail-coverts glossy blue-black; the bases of the feathers of the back bright buff; wings and tail dull black, glossy near the tips of the feathers; the inner margins of the primaries brown; entire under surface, including the sides of the neck and a band from $\frac{1}{2}$ to $\frac{3}{4}$ inch wide across the rump, light, glossy, chestnut-red, each feather, except on the belly, vent, and rump, with a *plainly defined* black shaft-streak; the ear-coverts with a broader but less plainly defined blackish-brown shaft-stripe, and their bases black; lower portion of loral region obscure chestnut; longer under tail-coverts blue-black; under wing-coverts paler chestnut than the breast, bases of the feathers along the edge of the wing black; shafts of primaries whitish beneath, brown above.

Young. Immature birds have the hue of the under surface paler than adults, and the shaft-streaks not so clear.

Obs. This Swallow, for years after its discovery in the island, was considered peculiar to it. The late Lord Tweeddale received a red-bellied Swallow from Malacca, which he considered identical with ours; and consequently *H. hyperythra* became a Malaccan bird, and, as such, appears in Mr. Holdsworth's excellent catalogue. Mr. Hume has, however, lately obtained Malaccan specimens, and finds that the peninsular bird is much larger, "wing 5·55 against 4·75 to 5·0" (my largest specimen measures 4·9), has a proportionately smaller bill, the chestnut rump-band much wider (1·2 against 0·8), and the shafts of the earlier primaries black instead of brown; the colouring of the underparts and the rump-band is likewise deeper than in our bird. I have examined a specimen in the British Museum, and it is clearly a good subspecies or local race of *H. hyperythra.* The upper surface is much more brilliant, and the deep chestnut underparts, which are devoid of striæ, are at once noticeable. Mr. Hume has named it *H. archetes* (Str. Feath. 1877, p. 266), but it was previously named *H. badia* by Cassin (Gray, Hand-l. B. i. p. 69).

Distribution.—This fine Swallow was discovered by Layard, who met with it in 1849 near Ambepussa. It is widely distributed throughout all the low country, with the exception of the extreme north, where I have

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* This Swallow is often placed under the subgenus *Cecropis* (Boie), which was established for the reception of certain species which have the underparts streaked and often rufous, as well as the head or rump, or both. I shall, however, retain all the Swallows under the one genus, and point out the characters upon which the different *subgenera* have been founded. These have either reference to plumage or to shape of tail—the first not always, in my opinion, of *generic* worth; and the latter a character of but little value in the Swallows, for it is unaccompanied by any corresponding structural variation, such as shape of bill or wing.

not noticed it. In the forest-districts lying between Dambulla and the latitude of Manaar it is local, being chiefly confined to small tracts of cultivation in the vicinity of tanks; in the Eastern Province, which is equally wild, it is restricted to similar localities, and in the Western Province is found principally in the interior. So plentiful is it, however, in the south-west of the island, that it is the common Swallow of the town of Galle, and seems to affect the sea-coast quite as readily as the interior, except during the wet windy weather of the south-west monsoon, when it retires for shelter to the secluded vales away from the sea-board. About Kandy, and in the Central Province generally up to 3000 feet, it is common, and in Uva and Haputale is found much higher than that elevation, for I have known it to breed at 4000 feet in the latter district. Mr. Bligh has seen it once at Nuwara Elliya; but it is rare on that elevated plateau, although in many of the coffee-districts it may be seen hawking at higher altitudes than that of the Sanatarium. In the Morowak-Korale district it is not uncommon.

Habits.—Our Ceylon Swallow frequents towns and villages alike with the country. In the latter, marshes and paddy-fields, open glades in secluded valleys, and lonely tanks in the wilds of the jungle are the places to which it is partial. It is found in the Central Province a great deal about estate-stores and bungalows, and often consorts there with the little Bungalow-Swallow, breeding in cattle-sheds and outhouses and permanently frequenting their vicinity. It is a characteristic bird of the wild village tanks in the Vanni, and its cheerful chirrup is often one of the first bird-sounds which meets the ear, on the sportsman suddenly emerging from the forest and finding himself standing at the brink of one of those interesting places. Several have perhaps been resting on a dead log, half covered with weeds and water, or sitting on the dried mud of the bed of one of these small reservoirs, and finding the solitude of their retreat suddenly invaded, glide off on the wing, uttering their curious guttural notes, at the same time that, from the same cause, half a dozen lazy-looking but watchful crocodiles rush, with a mighty splash, into the muddy pool. Such haunts as these literally teem with insect-life; and I have seen scores of these Swallows hawking about a small water-hole of about half an acre in extent, which was all that remained of what was, in the wet season, a fine sheet of water. Its flight is slower than that of most Swallows, and it often sails along on outstretched wings, now and then making a sort of circle in its course. In the south it is fond of frequenting paddy-fields made in the narrow glades lying between the low wooded hills characteristic of that part.

Nidification.—The Red-bellied Swallow breeds in the north, west, south, and centre of the island from March until June, constructing a Martin-like nest in outhouses, open dwellings, or under culverts and bridges. The nest is composed externally of mud and lined with feathers; it is large, and the entrance is situated usually at the end of a spout, running from 3 to 6 inches along the planks at the top of the nest; some have merely a circular orifice at the top. One which I frequently observed during the course of its construction was built in a merchant's office in Galle, the familiar little architects taking no notice whatever of the clerks who wrote at their desks just beneath; it was completed in about three weeks, the spout being added last, and after this was finished, one of the pair took up its position inside the nest and received the feathers brought by its mate to the entrance. The eggs are either two or three in number, and some brought to me as belonging to this bird were pure white and pointed lengthy ovals in shape, much resembling those of *Cypselus affinis*; they measure 0·85 inch by 0·56 inch. I have not taken the eggs myself.

The figure of this species in the Plate accompanying my article on *Munia kelaarti* is that of a male shot at Pan-kulam tank, Trincomalie.

HIRUNDO ERYTHROPYGIA*.

(THE LESSER MOSQUE-SWALLOW.)

Hirundo erythropygia, Sykes, P. Z. S. 1832, p. 83; Jerdon, Madr. Journ. 1840, xi. p. 237; Adam, Str. Feath. 1873, p. 370; Aitken, ibid. 1875, p. 212; Butler, *t. c.* p. 451; Cripps, ibid. 1878, vol. vii. p. 257.

Hirundo daurica, Blyth, Cat. B. Mus. A. S. B. p. 198 (1849, in part); Layard and Kelaart, Prodromus, Appendix, Cat. p. 58 (1853); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 92 (1854, in part); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 170; Jerdon. B. of Ind. i. p. 160 (1862, in part); Holdsw. P. Z. S. 1872, p. 419.

Cecropis erythropygia, Jerdon, Ibis, 1871, p. 352.

Lillia erythropygia, Hume, Nests and Eggs, ii. p. 76 (1873); id. Str. Feath. 1877, p. 255.

The Red-rumped Swallow, Jerdon. *Masjid ababil*, lit. "Mosque-Swallow," Hind.

Adult male and female. (Specimens in the British Musuem.) Wing 4·4 to 4·5 inches; tail 3·0 to 3·3, centre feathers 1·1 to 1·4 shorter; tarsus 0·5; middle toe without claw 0·48; bill to gape 0·5 to 0·55. Females seem to be shorter in the tail than males.

Mr. Hume, in his valuable mongraphic notice of the subgenus *Lillia*, gives the length at from 6·5 to 7·0, average 6·75 inches; wing from 4·1 to 4·5. Weight 0·62 oz. (*Cripps*).

Iris brown; bill, legs, and feet black.

Head, nape, hind neck, back, scapulars, lesser wing-coverts, and longer under tail-coverts glossy blue-black; greater wing-coverts, primaries, secondaries, and tail-feathers brownish black, glossed chiefly on the outer webs with greenish; a superloral streak passing above the eye, spreading out over the ear-coverts, and running thence beneath the nape dark ferruginous chestnut; rump and shorter upper tail-coverts paler chestnut than the cheeks, forming a band about $\frac{3}{4}$ inch or more wide; in some specimens there are a few black-shafted feathers among the upper tail-coverts; a black spot immediately in front of the eye, between which and the bill the lores are whitish; entire under surface, with the under wing- and under tail-coverts, buffy white, palest on the throat, and most strongly washed with buff on the flanks, each feather, except on the belly, with a fine brown shaft-streak; terminal portion of the under tail-coverts black.

Young. A specimen from Behar has the inner secondaries tipped with rufescent, and is very strongly tinged with buff on the flanks and under wing-coverts. Another from the Godaveri River has the chestnut colour of the cheeks and ear-coverts of less extent and very pale; inner secondaries tipped with buffy white; stripes of the under surface bolder than in the adult; chestnut rump-band very pale, and with one or two *dark stripes*; a pale spot on the inner web of the outer tail-feathers.

The just-flown nestling, according to Mr. Hume, has hardly any trace of striations.

Obs. This Swallow was confounded by Layard with the larger northern form, *H. daurica*, Linn., = *H. alpestris*, Pallas, *apud* Hume, or rather with some one or other of the Himalayan birds, which were then considered identical with the Central-Asian species. Specimens of *H. alpestris* from Mongolia, Assam, and other parts of Central Asia, which I have examined, have the wing 4·8 to 5·1 inches and the tail 4·1 to 4·6; the striations of the under surface are bolder and the uropygial band wider than in *H. erythropygia*, and streaked in some specimens with dark shaft-stripes; a whitish spot on the inner web of the outer tail-feathers is present in some skins.

H. nipalensis belongs to this group, with the well-marked striations on the under surface. Wing 4·6 to 4·8 inches; no white on tail; wings and tail brown; rump-band 0·8 to 1·0; ears dingy yellowish white or pale dingy rufescent, densely striated with dusky. Its larger size and bolder striations distinguish it, too, from the subject of the present article.

* This species and its allies are placed by some in the subgenus *Lillia*, characterized by the rufous or pale underparts either striated or unstriated, and by the rufous rump-band striated in most.

H. intermedia, Hume, is another and a new species from the hilly regions of Northern India. Mr. Hume has received it from Assam; it is a large bird; wing 5·0 to 5·2 inches. It has no rufous nuchal collar, and the rump-band is uniform.

H. striolata, Temm., inhabits the Indian archipelago. A specimen from Flores has the wing 4·1 inches; outer tail-feathers 3·6; stripes of under surface much bolder than in a Mongolian example of *H. daurica*; the upper tail-coverts have broad stripes. An allied form, if really distinct, to the latter exists in Mr. Hume's new species. *H. substriolata* (Str. Feath. 1877, p. 264). It has the underparts more richly coloured, a less massive bill, and longer tail.

Distribution.—This little Swallow only finds a place in the avifauna of Ceylon as a straggler, and but two instances of its occurrence in the island have been brought to my notice. Layard, the first to get it in Ceylon, writes thus concerning it:—"I found one of these birds in the village of Pt. Pedro in December: it had probably been driven over from the opposite coast by stress of weather: it was hawking about the street. I fired at and wounded it, but it flew away. Next day it was again in the same place, and I succeeded in killing it." At this season of the year the north wind, styled at Colombo the "longshore wind," brings many Indian birds to our shores, and doubtless was the means of driving the present species southward of its natural habitat; but as it is an inhabitant of the Nilghiris and other parts of the south of India, it is strange that it does not more frequently visit Ceylon. In the second instance it was procured by Mr. Bligh on the Catton Estate in April 1877.

This Mosque-Swallow is found throughout India; it is recorded from the Nilghiris, Mysore, the Deccan, Mount Aboo, Deesa, and Cashmere, as far up as Chungus on the Tawi river, where Mr. Brooks observed it. Jerdon says that he has seen it in every part of India, from the extreme south to Darjiling, which remark, however, does not hold good as to its distribution in every respect, as the latter locality is inhabited by the larger species, *H. nipalensis*, not then discriminated by Jerdon from the present. Captain Butler remarks that a few birds remain at Deesa the whole year round, but most return to the hills during the hot weather, or between the 30th April and the 25th June. Mr. Adam writes that it is not very common at the Sambhur Lake, but that it breeds there notwithstanding. In Furreedpore Mr. Cripps found it abundant. At the eastern side of the Bay of Bengal it is replaced in Tenasserim by the Himalayan race, *H. nipalensis*. From some portion of the mainland it may perhaps stray across to the islands of the Bay, for Mr. Hume mentions seeing one between Preparis Island and Calcutta when out of sight of land.

It may not be out of place to mention here that the Swallow alluded to under the name of *H. daurica* by Swinhoe as breeding in Northern China, and which Jerdon refers to in his article on this bird ('Birds of India'), really belonged to another allied species, *H. striolata*, Temm. & Schlegel, mentioned above.

Habits.—This little Swallow in India is fond of frequenting mosques and other buildings, as well as the vicinity of walls or bridges, under which it hawks in search of the insects which affect the proximity of water. Mr. Aitken writes of it as follows:—"This is one of those birds which seem highly to appreciate the advantages of civilization, and to think, like Cowper's cat, that men take a great deal of trouble to please them! In Berar they have almost discarded the mosques which gave them their name, and have betaken themselves to the culverts of the roads which are now being constructed all over the country. Wherever a road is made some of the culverts are sure to be taken possession of, as soon as the rains commence, by pairs of these Swallows, which may be seen darting in at one end and out at the other, or hawking about for flies over the pools of water at the roadside. Their flight has, however, nothing of the extreme rapidity of that of the Swifts or Wire-tailed Swallows. During the cold season the young often assemble in large flocks; but these all disperse or perhaps migrate as the weather gets warmer, and only a few pairs remain to breed during the monsoon." I conclude that the numbers of these birds seen by Col. Sykes were young; he says "it appeared for two years in succession in countless numbers on the parade-ground at Poona; they rested a day or two only, and were never seen in the same numbers afterwards."

Nidification.—The breeding-season of this species is said to last from April to August. The nest, writes Mr. Hume, "which is usually affixed to the under surface of a ledge of rock or the roof of some cave or building, and which is constructed of fine pellets of mud or clay, consists of a narrow tubular passage like a

white-ant gallery on a large scale, some 2 inches in diameter and from 4 to 10 inches in length, terminating in a bulb-like chamber from $4\frac{1}{2}$ to 7 inches in diameter externally." The interior is lined with feathers or grass. These retort-shaped nests vary in the extent to which the tube is constructed, and some think that the larger ones are intended as roosting-places or residences. The following account of Mr. Davison's experience of one of these nests seems to confirm the idea, borne out by the anecdote in the next article, that Swallows have a peculiar instinct for immuring their enemies! While examining some of these nests at Ootacamund he came upon one which "had the tubular entrance walled up and the mud perfectly hard and dry. On breaking away a part of the nest I found a dead bird in it, which had come quite to the sealed end of the tubular neck and had there died. The nest contained three old eggs, of which the contents had partially dried up. I can only account for this walling up of the entrance to the nest by supposing that some of the other birds had coveted and failed to obtain this site for their nest. It is only natural to suppose that more than one pair were concerned in the business, as it would have taken at least one bird to keep the inmate from leaving the nest and another to keep its mate away from it, and probably another or several other pairs to close the entrance." The eggs, which are pure white, are long ovals in shape and sometimes a little pyriform; they have, says Mr. Hume, little or no gloss, and average in size 0·78 by 0·55 inch.

HIRUNDO JAVANICA*.

(THE BUNGALOW-SWALLOW.)

Hirundo javanica, Sparrm. Mus. Carls. fasc. iv. t. 100, "Java" (1789); Bourdillon, Str. Feath. 1876, p. 374; Fairbank, ibid. 1877, p. 392; Tweeddale, Ibis, 1877, p. 316.

Hirundo domicola, Jerdon, Cat. B. S. India, Madr. Journ. 1874, xiii. p. 173; Blyth, Cat. B. Mus. A. S. B. p. 198 (1849); Kelaart, Prodromus, Cat. p. 118 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 170; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 384 (1854); Jerdon, B. of Ind. i. p. 158 (1862); Blyth, Ibis, 1866, p. 336; Gould, B. of Asia, pt. xx. pl. 13 (1868); Jerdon, Ibis, 1871, p. 351; Holdsw. P. Z. S. 1872, p. 418; Morgan, Ibis, 1875, p. 313.

Hypurolepsis domicola, Hume, Nests and Eggs, p. 73 (1873); id. Str. Feath. 1874, p. 155.

The Nilgherry House-Swallow, Jerdon, B. of India; *The Hill-Swallow* in Ceylon.

Wæhælaniya, Sinhalese.

Adult male and female. Length 4·9 to 5·0 inches; wing 4·0 to 4·1; tail 1·8; tarsus 0·35; middle toe and claw 0·4 to 0·5; bill to gape 0·47 to 0·51; wings exceeding the tail by 0·5 when closed.

Tail short and slightly forked.

Iris deep brown; bill blackish, base of lower mandible reddish; legs and feet brown, the edges of the tarsal scales whitish; claws black.

Head, upper surface, scapulars, and lesser wing-coverts glossy greenish black; wings and tail black, with a slight greenish gloss; the upper tertials tipped white; a bar-shaped white spot on the inner webs of all the rectrices but the middle pair; lores and ear-coverts black; forehead, chin, throat, and chest ferruginous, darker on the forehead than beneath; under surface cinereous brown, paling to whitish down the centre of the breast, the adjacent feathers being tipped whitish; under tail-coverts black, tipped white, the longer feathers glossed with greenish.

Young. The nestling when fledged does not differ much from the adult, its chief characteristic being the unglossed upper surface. The forehead is edged with pale rufous, the tertials the same; tail with the spots smaller than in the adult, and the rufous of the throat not so dark, paling to rufescent white on the breast: under tail-coverts tipped with rufescent.

Obs. The Swallow of the Nilghiris, with which the Ceylonese bird is identical, was described by Jerdon as *H. domicola*, but it has of late years been found that the Malayan species, *H. javanica*, cannot be separated from it. Lord Tweeddale ('Ibis,' 1877, p. 316), in speaking of a Lampong (south-east Sumatra) specimen, says, "Neilgherry examples (*H. domicola*, Jerdon) cannot be separated." Messrs. Hume and Davison likewise consider the Tenasserim birds identical with South-Indian. Jerdon, in commenting on Gould's plate ('Birds of Asia,' pt. xx.) of *H. domicola*, remarks that it appears to be very close to the true *H. javanica*, but that is said to be a good deal larger bird. As regards this, I have compared the Ceylonese race with specimens from Sumatra, Sarawak, Bouru, Lombok, Sula Islands, East Timor, West Java, Labuan, Penang, and find that the balance is slightly in favour of the eastern race. A Sarawak example measures 4·2 inches in the wing; a Bouru 4·35; a West-Javan 4·2; but others do not exceed my specimens; one from Timor has a wing of 4·0 only, two from Penang 4·15. I observe, however, that all these examples, except those from Labuan and Lombok, are conspicuous for the *bluer* tinge of the upper plumage, the two exceptions mentioned being *green*, like the Ceylonese, all of which present the same character. The outer tail-feathers also are more pointed than those of my specimens, the under tail-coverts are not so dark, and the rufous on the ear-coverts is brighter. I have not had the advantage of comparing my birds with a South-Indian series, and I therefore state these facts, as they may be of use to those who wish to investigate the matter. In any case this could only be looked upon as an interesting local variation of no importance.

* This Swallow has been placed in the subgenus *Hypurolepsis*, as differing from true *Hirundo* in its shorter and subfurcate tail.

Distribution.—The familiar little Hill-Swallow is a resident inhabitant of the mountains of Ceylon, and is, as in the south of India, restricted to high elevations. Though common as low down as the valley of Dumbara, it appears resolutely to decline any descent into the hot regions round the base of the mountains, for I have never seen it, or heard of it being observed, in the low country. It is found in the open districts formed by the great valleys in the Central Province, about estates, and on the plains of the upper regions, being very common at Nuwara Elliya and in the neighbourhood. I observed it at Horton Plains, and in the southern ranges met with it in the Morowak and Kukkul Korales; and throughout the high tract formed by these and the adjoining Korales it is found down to the same altitude as in the Kandy country.

This little Swallow is found in the south of India on the Nilghiris, Palanis, and Travancore hills. It frequents the higher parts of these ranges, being recorded from the Palanis at 5500 feet elevation. Mr. Bourdillon remarks that they persistently remain about the same ravines and do not travel much. Jerdon writes that he saw some Swallows at Bangalore and observed their nests in the verandah of a house there, and that in all probability they belonged to this species. I find no recent observation of it at that place, but I have no doubt Jerdon was correct in his surmise. Its range extends eastwards from the south of the peninsula into the Andamans, Tenasserim, Malacca, and thence south into Borneo and Java, and furnishes an important instance of the affinity between the South-Indian, Cevlonese, and Malayan avifauna, which is exemplified in more than one species dealt with in this work. To the Andamans it is a monsoon visitant, being common there from the beginning of June to the end of September. In Tenasserim it is "rare and probably confined to the more southern portions of the province" (*Hume*); in fact Mr. Davison only met with it at Mergui in June. Judging from these dates it would appear that it migrates with the south-west monsoon from South India or Ceylon across to the last-mentioned localities, not straying above 13° or 14° N. latitude. It was procured in Borneo by Mr. Mottley and in Lampong by Mr. Buxton, and there are examples in the national collection from Lombok and Bouru. Dr. Meyer records it from Celebes (Tello, near Makassar).

Habits.—To the resident in the beautiful mountains of Ceylon this little bird has much the same interest as that which the Common Swallow possesses for the occupants of the many English homes to which it is so welcome a visitor; with this difference, however, that it is a constant attendant about the Ceylon bungalow throughout the year, flitting in and out of the rose-covered and trellised verandah, gliding over the spacious barbecues bestrewn with the rich produce of the estate, or settling on the roofs of the pulping-houses, from the tops of which it utters its merry little twitter while it prunes its glossy plumage in the rays of the morning sun. No wonder, then, that it is a general favourite with the planter, reminding him of scenes far away, and bringing back to him recollections of those from whom he is so widely removed. In the mind of the author this interesting bird is connected with pleasing memories, not easily forgotten, of much kindness received, and, moreover, of the glorious mountain prospects viewed from the verandah of many a hospitable bungalow, round which he has often seen it flying while resting after the exertions of a long toil up the zigzag

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? COTYLE OBSOLETA.

(THE PALE CRAG-MARTIN.)

Cotyle obsoleta, Cabanis, Mus. Hein. i. p. 50 (1850); Dresser, B. of Europe, pt. 37 (1875).
Ptyonoprogne pallida, Hume, Str. Feath. i. p. 1 (1873).

"Upper parts very pale greyish sandy brown, darkest on the head and palest on the rump; lores blackish brown; underparts creamy white; on the chin and upper throat almost pure white; flanks, lower abdomen, and under tail-coverts washed with dull rufous brown;" wings and tail brown; tail-feathers with a large white spot on the inner web of all but the central and outermost pair.

"Length 5·2 to 5·5 inches; wing 4·5; tail 2·1.

"Bill black, inside of mouth dirty yellow; tarsus dark brown, soles whitish; iris dark brown." (*Dresser.*)

paths of the estate. It is found about the villages of the Kandyans, and hawks for its food over patnas and cleared hill-sides, as well as round the stores and buildings of the estates. On some bare spot or on a pathway in the open it may sometimes be seen resting, and I have occasionally seen it perched on a dead branch or stake; but its favourite post is the eave of some building. Its flight is very buoyant but not at all swift, and its twitter is not unlike that of the Common Swallow.

Nidification.—The breeding-time of the Hill-Swallow is in April, May, and June; it nests in the verandahs of bungalows and outbuildings of estates, and under the eaves of native houses, building sometimes beneath the ceilings of rooms without evincing any fear of the inmates. Such a nest I once observed in the sitting-room of the old Banderawella Resthouse. It is usually placed against the side of a beam or projecting baulk of timber, and resembles in its construction that of the last species, though somewhat smaller. It is composed of mud and lined with feathers, threads, small pieces of rag, and such materials as it may pick up about its adopted residence. The eggs are usually three in number, stumpy ovals in shape, and of a white ground-colour, spotted pretty evenly with brownish red. In Southern India its nesting-habits are much the same; and it appears from the following interesting anecdote which I subjoin, from the notes of Miss Cockburn, that its domicile is sometimes invaded by the truculent Sparrow. Her remarks, as quoted by Mr. Hume in 'Nests and Eggs,' are as follows:—"They are fond of returning to the same places in which they build every year, and appear to prefer erecting their little nests in verandahs and eaves of outhouses. Many years ago I remember watching a battle between a Cock-Sparrow and a pair of House-Swallows. The latter had finished their neat nest in our verandah when the Sparrow discovered it, and never left it except for the purpose of satisfying his appetite. The poor Swallows saw they could do nothing, so they disappeared and told their friends the sad tale in Swallow language, and (as in the multitude of counsellors there is wisdom) some time after, to our surprise, we saw a number of House-Swallows each with a wee lump of clay in its bill. They flew up to the nest and succeeded in building up the sides, the Sparrow inside doing his utmost to stop the work, but they, being accomplished artisans in their own masonry, did not take a second to fix each piece of clay. It became a most exciting scene, and we fully expected the Sparrow would have been imprisoned for life; but no, he was much too crafty to allow that; with one effort he burst through the very small hole that was left unclosed and escaped, being attacked by all the Swallows at the same instant; and this conflict ended by the rightful owners having possession of their nest." This extraordinary feat is, I think, an instance of the most wonderful instinct on the part of birds that it is possible to conceive.

Both in South India and Tenasserim it commences to build in April, continuing in the former place until June. Mr. Morgan has found the nest on rocks and cliffs, and remarks that it is very firmly cemented to the object against which it is placed. I once found a Swallow's nest in a small cavern or recess in the face of a cliff in Haputale, and it no doubt belonged to this species. In some eggs there is a tendency in the markings to form a zone at the large end. They measure about 0·77 by 0·5 inch.

We have the authority of my friend and correspondent Mr. Bligh, Catton Estate, for the interesting occurrence of a Martin in Ceylon. The birds have been seen by him on several occasions during the north-east monsoon in the beautiful Kandapolla valley in the Haputale range; but he has been unable to procure a specimen so as to identify the species satisfactorily. I accordingly suggest, in this footnote, the possibility of it being the Pale Crag-Martin, and have given Dresser's description for the guidance of any who may hereafter procure specimens in Ceylon.

Possibly it may be the Cashmere House-Martin, which is very like the English Martin, but has the flanks brownish and the axillaries dark brown; but as Mr. Bligh mentions the dusky under surface of his bird, I have thought it more likely to be the species here indicated.

Mr. Bligh, in writing to me in March 1876, speaks of his discovery and remarks:—"I have seen several but could not obtain a specimen; it is not, I feel sure, the English bird, as it looks much darker underneath, or rather the white is not so pure." In the cool season of 1877–8 he again saw several, but had no gun with him at the time; and just as I am going to press with this I receive a letter in which he says:—"I saw a Window-Martin as late as April this year; it came within five yards of me; it is a smaller species than *C. urbica* and duller in colour."

This species is an inhabitant of Palestine and North-east Africa, and has been found in Beluchistan and in Sindh.

PASSERES.

Fam. FRINGILLIDÆ.

Bill short, thick at the base, conic, tip acute and entire; culmen more or less flattened. Nostrils round, basal, placed near the culmen; gape smooth. Wings moderately long, the first three quills nearly equal. Tail of 12 feathers, not longer than the wing, even or forked. Legs and feet stout. Tarsus covered with transverse scutes; hind toe of medium size.

Of small size.

Genus PASSER.

Bill very short, compressed towards the tip, tumid at the base; the culmen flattened. Nostrils small, round, placed in a membrane, partly concealed by tufts. Wings with the first three quills subequal, the 1st either shorter than, or equal to, the 2nd. Tail shorter than the wings, even at the tip. Tarsus longer than the middle toe and claw, protected by stout transverse scales; lateral toes subequal and much shorter than the middle one; hind claw moderately large.

PASSER DOMESTICUS.

(THE COMMON HOUSE-SPARROW.)

Passer domesticus, Linn. Syst. Nat. i. p. 323 (1766); Shelley, B. of Egypt, p. 148 (1872); Dresser, B. of Europe, pt. 48 (1876); Irby, B. of Gibraltar, p. 119 (1875); Seebohm, Ibis, 1876, p. 114; Newton's Ed. Yarr. B. Birds, vol. ii. p. 89 (1876).

Passer indicus, Jardine & Selby, Ill. Orn. pl. 118 (1848); Blyth, Cat. B. Mus. A. S. B. p. 119 (1849); Kelaart, Prodromus, Cat. p. 126 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 258; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 499 (1856); Jerdon, B. of Ind. ii. p. 362 (1863); Blyth, Ibis, 1867, p. 41; Holdsw. P. Z. S. 1872, p. 464; Hume, Nests and Eggs, ii. p. 457 (1874); id. Str. Feath. 1873, p. 209; Adam, *t. c.* p. 387; Ball, ibid. 1874, p. 421; Tweeddale & Blyth, B. of Burm. p. 93 (1875); Oates, Str. Feath. 1875, p. 156; Brooks, *t. c.* p. 254; Butler & Hume, *t. c.* p. 496; Fairbank, ibid. 1877, p. 408; Hume & Davison, B. of Tenass., Str. Feath. 1878, p. 406; Ball, ibid. vii. p. 222; Cripps, *t. c.* p. 294.

Pyrgita domestica (Linn.), Hodgs. Zool. Miscel. 1844, p. 84.

Philip Sparrow, Old English; *The Indian House-Sparrow.* *Gorrion*, Spanish; *Bertal*, Moorish (Irby); *Haussperling*, German; *Musch*, Dutch; *Pardal*, Portuguese; *Gouriya*, Hind. in North; *Churi*, *Khas churi*, Hind. in South; *Charia*, *Chatta*, Bengal.; *Uri-pickike*, Telugu; *Adike lam kuruvi*, Tam. (Jerdon); *Pastro pardal* or *Pardan*, Ceylon Portuguese; *Addikalan*, lit. "Sheltering bird," Tamils in Ceylon.

Gewàl-kurulla, lit. "House-bird," Sinhalese; also *Geh-kurulla*, Layard.

Adult male (Ceylon). Length 5·6 to 5·8 inches; wing 2·95 to 3·1; tail 2·3 to 2·4; tarsus 0·65 to 0·7; middle toe 0·6, claw (straight) 0·19; bill to gape 0·52.

Female. Length 5·6 inches; wing 2·7 to 2·8; bill to gape 0·5; tail 2·1 to 2·2.

Male. Iris olive-brown, greyish brown, or brown; bill black; legs and feet fleshy brown or reddish brown. Some specimens have the culmen abnormally ridged, and the contour of the bill varies somewhat in different individuals.

Breeding-plumage. Centre of the forehead, crown, and nape ashy grey; lores, upper part of cheeks and ear-coverts, chin, down the centre of the throat, chest, and upper breast black; this colour extends more or less over the eye (in some specimens hardly traceable) and also past the gape, uniting the black of the lores with that of the chin: cheeks, ear-coverts, and sides of throat just below the ears whitish, more or less faintly tinged with greyish, and bounded beneath by the black of the chest, which spreads out; a few white feathers occasionally above the eye, above which, extending down the sides of the nape upon the neck and uniting across the back of it, is a long patch of deep chestnut; lesser wing-coverts and upper part of back the same, the latter region striped broadly with black; median coverts deeply tipped with white, which is surmounted by a black patch on the inner webs of the feathers; greater coverts and tertials black, at the centres of the feathers broad margins of chestnut-brown; primaries and secondaries dark brown; primary-coverts blackish brown; the whole narrowly edged with fulvous, which encroaches on the web just beyond the primary-coverts, and also near the centre of the longer primaries, forming two patches on the closed wing; lower back and rump brownish grey, marked generally on the rump with fulvous; tail greyish brown, the feathers finely margined with tawny grey; beneath from the breast to under tail-coverts impure white, darkened with greyish on the flanks; shafts of the under tail-coverts dark; under wing whitish, the edge marked with black.

Winter plumage. After the autumnal moult the black throat-feathers are tipped with white, deeply on the chest and narrowly on the throat; the upper-surface feathers are tipped with yellowish brown, giving a tawny appearance to the head, and almost obscuring the chestnut of the hind neck; the greater wing-coverts and tertials are much more deeply edged with chestnut of a more fulvous hue than the breeding-colour. The chestnut patch just behind the eye is less obscured than other parts, but even there the feathers are tipped with fulvous.

As the breeding-season approaches these margins wear off and leave the black and chestnut pure, but at the lower part of the chest where they are deep they mostly do not quite disappear.

Female. Iris brownish olive; bill olive-brown; margin and base of tarsus fleshy; legs and feet fleshy.

Head, hind neck, and lower back greyish brown, with often a tawny tinge; back striped with black on one web of the feathers as in the male, the other webs being dusky tawny; wings brown, with the markings distributed as in the male, but of an obscure tawny colour, the white tips of the median coverts not so deep; tail pale brown; a buff-white stripe above and behind the eye, between which and the ear-coverts there is a brown stripe; ear-coverts grey; chin and throat sullied white; under surface whitish, washed with grey on the chest and the flanks; feathers at the sides of the breast with dusky shafts, under tail-coverts with blackish ones.

Young. Iris dark olive-brown. Above greyish brown, obscurely banded on the head, hind neck, and rump with a darker shade; the interscapular feathers fulvous, the inner webs blackish; wing-coverts and tertials tipped and broadly margined with buff-white, above which the web is blackish; secondaries very broadly edged with buffy; tail very pale brown; eye-stripe and ear-coverts as in the adult female; cheeks faintly barred with brownish; chin and throat pale isabelline grey; under surface whitish, tinged with buff.

Obs. The Ceylon House-Sparrow belongs to that normally somewhat smaller and, as regards the female, *slightly* differently coloured race which inhabits India, and which has been separated by Jardine as *P. indicus*. Seeing, however, that the Sparrow has evidently, from the region in which the species was first installed by a creative Providence, followed the march of those classes of the human race which dwell in permanent habitations, it cannot have been otherwise as regards India, if, indeed, it was not there that it was originally located. It has been found to vary in size and coloration in certain districts which it has perhaps, at no very remote period, invaded. Mr. Seebohm remarks on the extremely bright colouring of the males he procured on the Lower Petchora, in Northern Russia, as compared with any thing he has seen: the Sparrow, therefore, in that region might be said to constitute a local race. In Siberia (whither, according to Professor Newton, it has wandered since the Russian conquest) it occasionally attains a very large size: an example from Krasnoyarsk measures 3·25 inches in the wing, showing that the climate of that region is conducive to robustness. I contend, therefore, that the difference in size of

Indian birds, which is chiefly apparent in the females, and the slight alteration in colour, is owing entirely to food and climatic influence.

Indian and Ceylonese examples are identical. A male from Madras in my collection measures in the wing 3·05 inches, and has the white cheek-patch and the under surface as much tinged with grey as in European birds. Specimens from Ceylon, and, as far as I have seen them, from India, have only a trace of the little white spot above and behind the eye and of the white edging above the lores; it is always more or less present, which, inasmuch as it is such an obscure characteristic even in the European bird, more than any thing, I think, tends to prove the identity of the two races. In England I find that the Sparrow varies in size, depending to a certain extent, as it would appear to me, on conditions of food. The largest birds I have seen are from farmyards in the country, where an abundant sustenance is afforded them. Five males in my possession measure from 2·9 to 3·05 inches in the wing, and females from 2·9 to 3·0.

Mr. Dresser, in his great work on European birds, unites the two forms, and Messrs. Hume and Blanford are likewise of opinion that the Indian bird cannot correctly be specifically separated.

Distribution.—As in other countries, the House-Sparrow is found about human habitations in almost every town and village in Ceylon. It evidently was formerly only an inhabitant of the maritime and large inland cities and villages of the natives, and probably affected the settlements in the valleys of the Kandyan province; thence it continued to follow the march of Europeans into the hills, during the opening up of the mountain forests from one elevation to another, until it has now established itself at Nuwara Elliya and is common there. Mr. Holdsworth remarks, in his catalogue, that old residents at the Sanatarium remember the time when "the now common Sparrows and Musquitos were unknown at that elevation." I have no doubt that when the solitudes of the Horton Plains are invaded, and the many allotments now marked out are studded with bungalows, the Sparrow will make itself as much at home there as he has done in the somewhat lower plain of Nuwara Elliya. I have visited villages in the interior of the northern forest tract where there were no Sparrows; but it is found at Anaradjapura, and I think all along the Northern road. Mr. Parker tells me it inhabits the villages in the Uswewa district.

It is generally diffused all over India, from the extreme south to the Himalayas, where Mr. Brooks found it above Mussouri, not differing at all from its companions of the plains. It is abundant in Sindh, and throughout the Kattiawar, Kutch, Guzerat, and Sambhur-Lake districts. In the Deccan it is, of course, common, and found everywhere around human habitations; it occurs on the Nilghiris and in the villages in the Palanis up to 5000 feet elevation (*Fairbank*). It is of course very numerous throughout Bengal, but gradually gets more local in its distribution as we travel to the eastward. In Cachar Mr. Inglis did not notice it; but it is found throughout Pegu, according to Mr. Oates, and Mr. Blyth says it is not uncommon at Akyab in Arracan. At Rangoon Mr. Hume says it is as common as *Passer montanus* (which replaces it to the south), and occasionally strays over to Moulmein in the Tenasserim province; but south of this it has not been procured or seen by Mr. Davison and others collecting in the province. Crawford is said to have procured it in Siam.

At some distant period it has, if not originally indigenous to the country, perhaps invaded India from Beluchistan and Persia, which it inhabits plentifully, although it is not universally distributed through Western Asia to Europe; it is, however, says Professor Newton, the common species of the Levant. As regards Palestine, Canon Tristram remarks, "The Sparrow of the Syrian cities is our own *P. domesticus*, which in his westward migrations has acquired neither additional impudence, assurance, nor voracity." Severtzoff records it from Yarkand, though Dr. Scully did not see it there or anywhere in Eastern Turkestan. In Siberia, as I have observed already, it is found, but only in certain localities: on the river Ob, Dr. Finsch observed it only near cattle-stations; in the town of Berezoff it occurred, but not in Obdorsk. Further east, Mr. Seebohm states that it abounds in all the towns and villages as far as Yenesaisk, and he met with it once at Kooray-i-ka, within the arctic circle, although it had entirely disappeared about latitude 60°. Beyond the Yenesay it ranges as far east, according to Dr. von Middendorff, as Ust Strelka, the confluence of the Chilka and Argun rivers, which there join to form the Amour. Between this point and the Chinese Empire (the very place, above all others, suited for it) the solitudes of Mongolia must present a bar to its advance. It is found near Lake Baikal, straying thence to the island of Olchon (*Dresser*).

In Northern Africa it is resident in Egypt and Nubia, and is abundant there; Mr. E. C. Taylor found it

swarming in Cairo, and says that it breeds in Upper Egypt in holes in the mud banks of the Nile. Further east it is locally distributed in Algeria and Morocco, *Passer salicicola* being, according to Mr. Taylor, the Sparrow of the country. On both sides of the Straits of Gibraltar it is common, and is spread similarly throughout Spain. In Italy it is partly replaced by an allied species, *P. cisalpinus*; but in Turkey it is common, being the Sparrow of the district round Constantinople. It is spread commonly throughout Central and Northern Europe, including Russia, in which empire it is found as far north as Archangel. To the westward it is generally distributed throughout Finland. In Sweden we learn, from Professor Newton's edition of Yarrell, that it follows the settlers into the forest wilds, and the most northern point recorded for it is Karesuando; in Norway it occurs in most of the settlements "along the coast to the Loffodens and Alten," but further north it is only occasionally seen. From the same authority we learn that the only places in which it does not exist are the Outer Hebrides and the hill-farms in Ayrshire, and that there is also a certain moorland village in Devon, called Shepstor, in which it is never seen. There are, likewise, places in the highlands where it is very rare, but everywhere else in Great Britain it is to be found. As regards Ireland it is apparently universally distributed throughout the country, although the information concerning it is not so full as might be wished. It occurs in Madeira occasionally, according to Mr. Godman, but is not recorded from any other of the Atlantic isles.

Habits.—In common with the Crow, which is an equally familiar feathered citizen in the East, the Sparrow is possessed of an extraordinary amount of domesticity and utter disregard of the human dwellers in the buildings which afford him shelter. His impudence and assurance are charming, and he by far excels his European relations in this respect. If he is not making his nest in your verandah, littering the whole place with straw, grass, rags, and a miscellaneous variety of building-materials, he is flying in and out of your breakfast-room, where he feasts on the crumbs beneath the table; and when he cannot supply himself from that source, he thinks but little of flying up and levying contributions, after the manner of the Crow, on the loaf, the moment the Appoo's back is turned. The Sparrow is seldom seen away from houses, except when the corn near villages is in ear; and then he may be found in the paddy-fields, feasting on the grain in common with Munias. In England, the hedgerows in early spring are resorted to, and it wanders away from its accustomed haunts, returning, however, at nights to roost; but in Ceylon it is not much found about isolated houses in the country, and has not the same opportunity of ruralizing as at home. The males are just as pugnacious as they are in colder climes; and during the breeding-season many a good sparrow-fight is carried on in the bungalow verandah, several neglected suitors sometimes setting on a coveted female and administering a most unmerciful chastisement; and it is a question whether, in the excitement of the fray, she does not receive an equal punishment at the beak of her favoured lord.

Owing to the open nature of buildings in Ceylon, the Sparrow comes more under human observation than he does in Europe, and is often voted a great nuisance; even the sanctity of the church is not the means of repelling his inroads, for he frequently disturbs a congregation by his loud chirpings underneath the tiled roof and by flying about in the most casual manner, as if the building were empty and he had a perfect right to do as he liked.

The general habits of the Sparrow are too well known to require recapitulation; and I have merely taken up room to say what I have on the subject in order to give my European readers some idea of its behaviour in the East. Its diet is both insectivorous and granivorous; and I have no doubt that the quantity of insects which it destroys counterbalances the evil which it is said to do in its attacks on grain.

Nidification.—As in England so in Ceylon, the Sparrow breeds all the year round; but the greater number of nests are built between the months of May and October; and during this period, in the Western Province at any rate, August is, I think, the favourite month. The nest is placed anywhere in a building or in a roof where there is sufficient cavity or space for its formation; it sometimes is built in a thickly foliaged lime-tree near a house, and is then a large structure of grass and straw lined with feathers, the entrance being a hole at the side. The natives, who are fond of the Sparrow, often fix an old chatty, pierced with a small hole, on their walls for it to nest in; and the offer thus made does not often seem to be refused, as these earthen vessels are just suited for the reception of a large and untidy bundle of straw, such as "Philip Sparrow" delights

in making. The number of eggs varies from three to six or seven; but I think four is the usual quantum. They vary much in colour and marking; and in the same nest I have found eggs totally differing from one another, such as several of a dark grey ground, thickly speckled and blotched with dark brown, and one, or perhaps two, of an almost pure white ground, openly marked with a few large spots of dark brown and inky grey; the usual type is a greenish-white ground, speckled throughout, but chiefly in a zone at the larger end, with dark brown and greyish brown. They vary much in size, some measuring as small as 0·75 inch in length by 0·57 in breadth, but the usual dimensions are from 0·8 to 0·85 by from 0·62 to 0·66.

Both sexes commonly share in building the nest; but occasionally it appears to differ as to choice of site. My correspondent, Mr. Parker, writes me, in March last, of an incident connected with this peculiarity which occurred in the Kurunegala Resthouse:—"About three days ago a pair of Sparrows began to build a nest in the roof of the verandah. I was surprised at the amount of straw and grass that they wasted, and, while enjoying a pipe, determined to watch their proceedings. It was soon evident that the two birds were not of one mind with regard to the site for the nest, and that each had selected a separate place. As soon as one bird went away in search of straw, the other industriously employed the time in removing to *its* nest the unprotected materials left by the other; and this went on without any intermission, though the birds appeared on the best of terms whenever they met. The result is, that after three days the floor is littered with straw that has fallen, but neither nest has made the slightest progress!"

Martins' nests are sometimes taken possession of; and doubt has been expressed as to whether the building-up of their enemy by the rightful owners in revenge for their eviction has ever really taken place; but in a former article I have given indisputable evidence in the matter from the pen of Miss Cockburn, one of the most accurate observers of birds in India; and though the species was not a Martin, yet the habits of these birds and Swallows are so similar, that one cannot doubt that they would be capable of treating the intruder after the same fashion.

Illustrative of its generally tame and literally domestic habits is the following racy account by Mr. Hume of its nesting in India:—"If domesticity consists in sitting upon the punkah-ropes all day, *chit, chit, chit, chittering* ceaselessly when a fellow wants to work, banging down in angry conflict with another wretch on the table, upsetting the ink and playing 'Old Harry' with every thing, strewing one's drawing-room daily with straw, feathers, rags, and every conceivable kind of rubbish, in insane attempts to build a nest where no nest can be—if, I say, these and fifty similar atrocities constitute domesticity, heaven defend us from this greatly landed virtue, and let us cease to preach to our sons the merits of domestic wives!

"Now everybody does, or ought to, know all about the nidification of Sparrows, that their nests are shapeless bundles of straw, grass, rags, wool, or any thing else that they can lay their bills or feet on, thickly lined with feathers stuffed into any holes or crevices about houses, huts, walls, old wells, &c. that they can find, and even, though rarely, into the centre of some thick bush."

The Sparrow, with all his faults (some more alleged than real), displays great attachment for its young. An instance of this is given by Professor Bell (Zool. Journ. i. p. 10, 1824), his account being thus rendered by Professor Newton in his edition of Yarrell's 'British Birds':—"A pair of Sparrows, which had built in a thatched roof at Poole, were seen to continue their regular visits to the nest long after the time when the young usually take flight. This went on for some months, till, in the winter, a gentleman, who had all along observed them, determined on investigating the case. Mounting a ladder he found one of the young detained a prisoner by a piece of string or worsted which formed part of the nest, having become accidentally twisted round its leg. Being thus unable to procure its own sustenance, it had been fed by the continued exertions of its parents." The same author cites a parallel instance which "had been recorded by Graves, who finding a nestling Sparrow in like manner entangled by a thread, observed that the parents fed it during the whole of the autumn and part of the winter; but the weather becoming very severe soon after Christmas he disengaged it lest its death might ensue. In a day or two it accompanied the old birds, and they continued to feed it till the month of March, by which time it may be presumed to have learnt to get its own living."

PASSER FLAVICOLLIS.

(THE YELLOW-THROATED SPARROW.)

Fringilla flavicollis, Frankl. P. Z. S. 1831, p. 120.

Gymnoris flavicollis, Blyth, J. A. S. B. 1844, xiii. p. 948; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 497 (1856); Hume, Nests and Eggs, ii. p. 461 (1874); id. Str. Feath. 1873, p. 420; Ball, ibid. 1874, p. 421; Fairbank, ibid. 1877, p. 408; Davidson & Wender, ibid. 1878, vii. p. 85; Ball, *t. c.* p. 223.

Ploceus flavicollis, Sykes, P. Z. S. 1832, p. 94.

Petronia flavicollis, Blyth, Cat. B. Mus. A. S. B. p. 120 (1849).

Passer flavicollis, Jerdon, B. of Ind. ii. p. 368 (1863); Blyth, Ibis, 1867, p. 42; Brooks, Str. Feath. 1875, p. 254; Butler & Hume, *t. c.* p. 497; Fairbank, ibid. 1876, p. 261.

The Yellow-necked or *Jungle-Sparrow*, Jerdon. *Raji*, Hind., or *Jangli-churi*; *Adavi-pichike*, also *Konde pichike*, Telugu (Jerdon).

Adult male (Futtehgur). Length 5·5 inches; wing 3·25; tail 2·3; tarsus 0·6; middle toe 0·55, claw (straight) 0·19; bill to gape 0·55.

Female (Futtehgur). Length (from skin) 0·5; wing 3·02 to 3·2; tail 2·2.

"Iris brown; bill black; legs cinereous brown" (*Jerdon*).

Above from the forehead to the upper tail-coverts, including the scapulars, pale sandy brown; wings and tail plain brown; the least coverts cinnamon-red, forming a conspicuous shoulder-patch, the next row with deep white tips, and the greater series with pale external edges and tips; the secondaries with less pale margins, and the primaries and tail with fine light edges; throat whitish, paling into sandy grey on the cheeks; fore neck, chest, and flanks very pale greyish brown, becoming albescent on the breast, belly, and under tail-coverts; on the centre of the fore neck *a large rich yellow spot*.

Female. Slightly paler above, with the red shoulder-spot not so deep in colour as in the male; yellow neck-spot slightly smaller and of a somewhat less rich yellow.

Young female (Madampe, Ceylon, October). Length 5·2 inches: wing 2·8; tail 1·8; bill to gape 0·55.

Iris brown; bill dark brown, lower mandible fleshy; legs and feet dusky bluish.

Above darker brown than the male above described; wing-patch brownish cinnamon; the coverts wanting the white tips; quills, primary-coverts, and secondaries dark brown with pale edges; beneath whitish, tinged with brownish grey, except on the throat and lower parts; yellow throat-spot very pale. Another example in moult has the yellow throat-spot almost imperceptible from abrasion; the wing-spot is of the same dull colour.

Female (Futtehgur, January). Chestnut wing-spot brighter than the above, the median coverts conspicuously tipped with white; the neck-spot small, but pure yellow in colour; this is the plumage after the first moult, the breeding-season being in May, and my birds being in first autumn plumage.

Obs. This interesting Sparrow belongs to a little group which was separated by Hodgson as *Gymnoris*; there are, according to Jerdon, two other species—*P. petronius*, Linn., of Europe, and *P. superciliaris*, A. Hay, from Africa. They have the bill slightly longer and less robust, and the tail proportionately shorter than the other Sparrows, and are characterized by the peculiar throat-spot. Blyth considers the Yellow-throated Sparrows are "linked to the ordinary Sparrow by the African *Passer simplex*, Licht., which has an intermediate form of bill and wants the yellow pectoral spot;" and, to avoid a multiplicity of genera, I keep this bird in *Passer*, though it forms, perhaps, a recognizable subgenus.

Distribution.—The Yellow-necked Sparrow is new to the avifauna of Ceylon, and has not yet been published as occurring in the island. I intended to have included it among the few species on which I made remarks

(Ibis, 1878, p. 201), but omitted to do so. I met with it in October 1876, while on a trip to Chilaw, close to Madampe. A considerable flock were together, in company with a number of Weaver-birds, on some openly-wooded grass-land near the sea. I only procured two specimens, as it was just sunset; and on returning a couple of days afterwards, I did not see the flock. One of the birds in question was in heavy moult, acquiring new primaries, so that I am not of opinion that it had recently arrived from India, although the locality favours the idea that it and its companions may have been visitors to the island.

Its occurrence in Ceylon is very interesting, as it ought by rights to be an indigenous bird there, being found over most of India.

It is spread throughout the empire, from the Himalayas (in which it occurs to an elevation of 5000 feet) to the extreme south, extending in a westerly direction as far as Sindh, where Messrs. James and Blanford procured it, but not passing into Burmah. In the south, of late years, it has been noticed by the Rev. Dr. Fairbank, who obtained it at Periakulam near the base of the Palanis; he likewise remarks that it is found everywhere in the Khandala district, though in small numbers. Messrs. Davidson and Wender, too, met with it in the Sholapoor districts of the Deccan, where it was rare, but breeding notwithstanding. Mr. Ball records it from many localities between the Godaveri and the Ganges, and says that it is nowhere so abundant in Chota Nagpur as in the Satpura hills, where he hardly passed a day without seeing numbers, and in some places found it in the thickest jungles. About Mount Aboo it is common on the hills and in the plains, according to Capt. Butler, breeding on the mount in April. Mr. Hume says that he believes it to be only a seasonal visitant to Sindh and Kattiawar; and Mr. James is of opinion that it breeds in the former region. Mr. A. Anderson procured it at Futtehgur, and Mr. Adam at Oudh, and remarks that it is very common all about the Sambhur Lake. Captain Marshall found it at Murree in July, and Mr. Brooks procured it at Dhunda above Mussoori.

Habits.—Jerdon writes of this Sparrow as follows:—"It frequents thin forest-jungle, also groves of trees, avenues, and gardens in the better wooded parts of the country. It lives in small parties, occasionally, during the cold weather, congregating in very large flocks; feeds on various seeds, grains, and flower-buds, and has much the same manners and habits as the common House-Sparrow. It has also a very similar note." On the occasion of my meeting it, it was associating in a flock in a characteristic spot of the north-west coast—open country, dotted here and there with clumps of by no means luxuriant wood, about the borders or in the middle of which stood ragged-looking trees with half-clad branches; the troop was settling on the tops of the trees and uttering such a Sparrow-like chirp as they flew from one to the other that I took them for Common Sparrows, more particularly as they had the same style of flight. The food of the specimens procured consisted of seeds of various herbs. Mr. James writes that it is common to see them in Sindh feeding on the pollen of the flowers of the wild Caper.

Nidification.—This Sparrow breeds in the plains of India in April and May, but in the Himalayas nests as late as July. It is said to breed throughout India, except in the extreme south, and in Orissa and Bengal proper (*Hume*). Good-sized trees, such as mangos, are generally chosen; and the nest is invariably placed in a hole, sometimes at a height of 30 feet from the ground. Mr. Hume writes:—"On one occasion I found a nest in a hole in a stem of an old Heens-bush (*Capparis aphylla*), which stem was barely 5 inches in diameter. The nest is generally only a little bundle of dry grass, thickly lined with feathers. If in a mango-grove much frequented by the common Green Paroquets, the feathers of these latter are sure to be chiefly used. Sometimes, however, a more or less cup-shaped nest is formed of fine strips of bark and tow being added to the grass; and, again, at times it is a regular pad of hair, tow, and wool, with a few feathers, all closely interwoven, and with only a little central hollow." Four is the greatest number of eggs laid, three being often found. They are described as dull, glossless, moderately elongated ovals, sometimes pointed towards the small end. The ground-colour, of which little is visible, is "greenish white, thickly streaked, some edged and blotched, all over with dingy brown, usually more a mixture of sepia or chocolate-brown than any other shade." They average in size 0·74 by 0·55 inch.

PASSERES.

Fam. MOTACILLIDÆ.

Bill lengthened, more or less slender, straight; the culmen curved at the tip. Nostrils placed nearer the margin than the culmen. Wings with the first three feathers nearly equal; the tertials greatly elongated, often exceeding the primaries. Legs and feet variable. The tarsus more or less lengthened and covered with transverse scales; hind claw variable, in some much lengthened. Tail of 12 feathers, lengthened and narrow.

Of small size, elegant form, and mostly of terrestrial habit.

Genus MOTACILLA.

Bill lengthened, typically slender, compressed towards the tip; the culmen sloping from the base, curved at the tip. Wings with the first three quills nearly equal, and either the 1st, 2nd, or 3rd the longest; tertials nearly equal to the primaries. Tail equal to, or longer than, the wings; narrow and rounded at the tip. Tarsus longer than the middle toe and claw, the lateral toes subequal, the outer, if any thing, the shorter; hind claw short and curved.

MOTACILLA MADERASPATENSIS.

(THE INDIAN PIED WAGTAIL.)

Motacilla maderaspatana, Brisson, Orn. iii. p. 478 (1783); Blyth, Cat. B. Mus. A. S. B. p. 137 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 268; Jerdon, B. of Ind. ii. p. 217 (1863); Hume, Nest and Eggs, ii. p. 377 (1874); Ball, Str. Feath. 1874, p. 415; Brooks, ibid. 1875, p. 246; Butler & Hume, *t. c.* p. 489; Davidson & Wender, ibid. 1878, p. 84; Ball, *t. c.* p. 219.

Motacilla maderaspatensis, Gm. Syst. Nat. i. p. 961 (1788); Holdsw. P. Z. S. 1872, p. 458.

Motacilla picata, Frankl. P. Z. S. 1831, p. 119.

Black-and-White Wagtail; *Bergeronnette de Madras*, Buffon; *The Great Pied Wagtail*, Gould. *Mamula*, sometimes *Bhuin mamula*, also *Khanjan*, Hind.; *Sakala sarela gadu*, Telugu (Jerdon).

Adult male and female. Length 8·5 to 8·75 inches; wing 3·7 to 4·0; tail 4·0 to 4·1; tarsus 1·0; middle toe and claw 0·8; bill to gape 0·8 to 0·82.

Iris dark brown; bill black; legs and feet brownish black.

Male, breeding-plumage. Upper surface, from the forehead to the upper tail-coverts, and also the entire neck and throat glossy black; wings and all but the two outer pairs of tail-feathers less intense black than the foregoing parts; a broad stripe passing from the nostril over the eyes and down as far as the nape, the tips and outer webs of the median and greater secondary-coverts, a very broad outer margin to the secondaries, and the two outer pairs of tail-feathers white; the base of the primaries and secondaries, a narrow outer edging to the former, and the under surface from the chest to the under tail-coverts also white, as are likewise the under wing-coverts; flanks greyish at the junction with the black of the upper surface.

Female in breeding-plumage has the distribution of the colours the same, but the black of the upper surface less pure.

Nonbreeding-plumage. The chin and face just beneath the eye and the gorge are white; upper surface not so intense a black as the breeding-dress. An example shot by Mr. Adam at the Sambhur Lake in August is in this plumage; it must have bred early in the year and changed at once.

Obs. This Wagtail, which carries off the palm as regards size among all the pied group, resembles somewhat the common Water-Wagtail of England, *M. lugubris*, in summer plumage, the latter differing in the large amount of white which encompasses the forehead, whole face, and ear-coverts, and the less intense black of the upper surface, with a proportionate paleness of the wing. It is a much smaller bird, the wings of those I have examined varying from 3·3 to 3·6 inches.

In most species of this group the forehead is white. The black forehead in the Indian species has a parallel in the fine African Wagtail, *M. vidua*, in which also the colour of the crown extends down in a point to the base of the bill.

Distribution.—This, the largest of the four Indian Wagtails, appears to be only a straggler to Ceylon in the cool season, there having been but one example recorded in the island. This is mentioned by Layard (*loc. cit.*), who remarks that he detected a single specimen in a collection of birds formed by Mr. Gisburne, C.C.S., in the Jaffna peninsula, the exact locality from which it came being supposed to be the island of Valenny. It may perhaps be a regular visitant to the extreme north of the island; but this is, I think, doubtful, as if so it would have been otherwise recorded from districts south of the Jaffna Lake.

This Wagtail has a wide but local distribution throughout India. It is found in suitable localities in various parts of the peninsula, and in both the east and west of continental India. It occurs in the south, for Jerdon remarks:—"It is found throughout the whole of India . . . but it does not appear to extend to the east of the Bay of Bengal. It also occurs within the Himalayas, for I found it at Sikhim." Messrs. Davison and Carter record it from the Nilghiris and the Cauvery river. "In the Deccan it is common and breeds" (*Davidson*); and Dr. Fairbank writes that it affects the rivers in the Khandala and Mahableshwar districts. Mr. Aitken writes of it at Poona, and the Rev. H. Bruce at Ahmednuggur. Mr. Ball, on the eastern side of the peninsula, records it from "Sambalpur, north of Mahanadi, Godaveri valley, Singhbhum, Lohardugga, Maunbhum, and the Rajmehal hills," and he considers it, with regard to the whole division of Chota Nagpur, to be one of the birds most commonly met with on its rivers. Captain Beavan found it rare in Singhbhum, only meeting with it on the Cossye river. Across the Central-Indian districts it is noted from various places, such as Agra, Etawah, Futteghur, the great river-system of this well-watered portion of India affording it abundant localities suitable to its tastes. From Sambhur Mr. Adam records it common about all the open wells and tanks; but at Mount Aboo it is, according to Capt. Butler, not very plentiful; he observed it there about the lake, and occasionally in the plains round the edges of tanks, river-beds, &c. It is a resident species in the sub-Himalayan region. Mr. Brooks records it from Mussouri, and says that he also obtained it in Cashmere, while beyond the great Himalayan range it was found breeding by Severtzoff in Turkestan.

Habits.—This fine species is essentially a water Wagtail, being rarely found away from water, and frequents the banks of rivers, ponds, tanks, wells, brooks, &c. I observe that it is said, like other members of its group, to have a partiality for that seemingly eccentric situation the roof of a house, on which it often perches when opportunity offers; and I have no doubt that, like its congeners, it would also seat itself on a telegraph-wire. Captain Butler, who noticed its habits at Mount Aboo, remarks that "it delights in a large rock standing out by itself in the water at some distance from the shore to settle and run about upon. In the absence of a rock, an old stump suits its habits and answers the purpose equally well." It is very active in its motions and possesses all the grace of deportment which so remarkably distinguishes the whole of this interesting group of birds. It feeds on insects, at which it darts, adroitly seizing them, and has been observed to catch as large prey as a dragonfly with which to feed its young. Jerdon states that it has a sweet song in the breeding-season.

Nidification.—The breeding-season of the Indian Pied Wagtail, in most parts of India, is in March, April, and May; but, like many other birds which nest in the southern hills, it rears its young there during the north-east monsoon at the end of the year. It is said always to nest in the vicinity of water, "but with this sole reservation, that it places its nest almost anywhere. These may be found in holes in banks, crevices in rocks, under stones, under clods of earth, amongst the timbers of bridges, in drains, holes in walls, on roofs, in fact anywhere except on shrubs or bushes" (*Hume*). It appears that when these birds, like the Common Wagtail* of England, make up their mind to build in a particular spot no amount of adverse circumstances will deter them from carrying out their plans. In Mr. Hume's interesting article on the nidification of this Wagtail ample testimony is given concerning the extraordinary spots chosen by it; and I append the following interesting particulars from the pen of this author:—"In the middle of the river Jumna, at Agra, there is an iron buoy attached to the pontoon-bridge which is surmounted by an iron ring, which lies down nearly horizontal; and in this ring, for several successive seasons, a pair of Pied Wagtails nested, within five yards of the roadway, and in full view of the thousands of passengers who daily cross the bridge. In the Chumbul, a little above its junction with the Jumna, a pair built in the old ferry-boat, which was but seldom used; and when the female was sitting she allowed herself to be ferried backwards and forwards, the male all the while sitting on the gunwale singing, making from time to time short jerky flights over the water, and returning fearlessly to his post.

"In this latter case the nest was nothing but one of those small circular ring-pads, say 4 inches in external diameter and 1 inch thick at the circumference, which the women place on their heads to enable them to carry steadily their round-bottomed earthern water-vessels; a dozen tiny soft blades of grass had been laid across the central hole, and on these, of course blending them down to the surface of the massive boat-knee on which the pad had been accidentally left lying, the eggs were laid.

"The character and materials of the nest are quite as various as are the situations in which it is placed. As to character, it varies from nothing up to a neat, well-formed 'saucer' or shallow cup; as to materials, nothing soft seems to come amiss to them: fine twigs, grass-roots, wool, feathers, horse-, cow-, and human hair, string, coir, rags, and all kinds of vegetable fibres seem to be indifferently used." My late friend Mr. A. Anderson writes that "a favourite situation at Futtehgur was the bridge of boats, the nests being usually placed inside a pigeon-hole either at the bow or stern of a boat." The eggs are usually four in number, sometimes three, and vary from a greenish or greenish-white to a pale earthy-white ground: those of the former type are marked with greenish-brown streaks, spots, clouds, and specks distributed sparingly over the surface, or chiefly confluent round the large end; the latter have dingy wood-brown markings, and, as in the former case, are divisible into two types—one in which the colouring takes the form of close speckling, and the other close smudgy mottling (*Hume*). The average size of a number of eggs is 0·9 by 0·60 inch.

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* It will, no doubt, be fresh in the minds of many of my readers who peruse the 'Times' newspaper that a pair of Pied Wagtails last summer (1878) built a nest on a beam beneath a third-class carriage belonging to the train which runs backwards and forwards on the little loop-line connecting the Cosham and Havant stations near Portsmouth. The train makes four or five trips a day; and during the time the female was incubating her eggs she remained on them while the train performed its journey, and her partner patiently sat on the telegraph-wires till she returned. I can vouch for the truth of this story, as I am acquainted with the station-master from whom the particulars of the occurrence were gleaned.

MOTACILLA MELANOPE.

(THE GREY WAGTAIL.)

Motacilla melanope, Pall. Reis. Russ. Reichs, iii. p. 696 (1776); Dresser, B. of Europe, pt. 41, 42.

Motacilla boarula, Gm. Syst. Nat. i. p. 997 (1788); Blyth, Cat. B. Mus. A. S. B. p. 137 (1849); Kelaart, Prodromus, Cat. p. 121 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 268.

Motacilla sulphurea, Bechst. Gem. Naturg. Deutschl. iii. p. 459 (1807); Newton, ed. Yarrell's Brit. B. p. 552 (1873); Shelley, B. of Egypt, p. 127 (1872); Irby, B. of Gibraltar, p. 108 (1875).

Calobates sulphurea* (Bechst.), Kaup, Natürl. Syst. p. 33 (1829); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 349 (1854); Jerdon, B. of Ind. ii. p. 220 (1863); Holdsw. P. Z. S. 1872, p. 458; Legge, Ibis, 1874, p. 22; Butler & Hume, Str. Feath. 1875, p. 489.

Calobates boarula (Gm.), Hume, Str. Feath. 1873, p. 201; id. Nests and Eggs, ii. p. 381 (1874); id. Str. Feath. 1874, p. 237.

Calobates melanope (Pall.), Swinhoe, P. Z. S. 1871, p. 364; Brooks, Str. Feath. 1875, p. 250; Hume, B. of Tenass., Str. Feath. 1878, p. 362; Ball, Str. Feath. 1878, vii. p. 219.

Bergeronnette jaune, French; *Alvelõa amarella,* Portuguese; *Jungle-Wagtail* (Jerdon), *The Grey-and-Yellow Wagtail. Mudi tippudu jitta,* Telugu (Jerdon); *Alveola,* in Azores (Godman); *Kisekiri*, Japan (Blakiston); *Piepita*, Spanish (Saunders).

Adult male and female (Ceylon). Length 7·3 to 7·5 inches; wing 3·1 to 3·2; tail 3·55 to 3·9; tarsus 0·8; middle toe and claw 0·65; hind toe 0·3, its claw (straight) 0·25; bill to gape 0·6 to 0·65.

Iris olive-brown; bill blackish horn, pale at the base beneath; legs and feet brown or reddish brown.

Winter plumage (Ceylon). Above ashy grey, slightly tinged with brown on the back, and the head somewhat pervaded with olive-greenish; least wing-coverts grey like the back; secondary and primary coverts, primaries, and secondaries blackish brown, the greater coverts with paler edges than the rest of the feathers; the tertials with the distal part of the outer web edged whitish; bases of the secondaries and tertials and the basal part of the inner web of all but the 1st four primaries white, running out towards the tip of the longest tertial feather; rump greenish yellow, blending with the grey of the lower back, and brightening into yellow on the upper tail-coverts: the 6 centre tail-feathers brownish black, with the margins near the base greenish yellow, the outer pair wholly white, the next two white, with all but the tip of the outer webs black, and the innermost pair with a black inner edge as well; a yellowish superloral streak passing over the eye (where it widens and becomes white) to above the ears; lores blackish; ear-coverts dark grey, with a yellowish patch just below the eye; throat and chest yellowish, deepening into bright yellow on the centre of the breast, abdomen, and under tail-coverts, the latter being the brightest; a few small brownish streaks on either side of the chin in some: thighs dusky yellowish.

The above is the plumage of the majority of adult birds while they are in Ceylon; many have a trace of the black summer throat in the dark markings just alluded to. The supercilium and cheek-patch vary in extent and in the amount of yellow in their colouring, some being whiter than others. Some have the head more olivaceous than others.

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* This Wagtail has been generically separated as *Calobates* by Kaup from the Black-and-White Wagtails (*Motacilla* restricted) on account of its different plumage. Its wings are said to be somewhat shorter, and its tertials less elongated; these distinctions will not hold good if it be compared with a series of species of *Motacilla*. The hind toe is perhaps a little shorter; but, on the whole, I prefer to follow Messrs. Dresser, Newton, and others, and keep the present species in *Motacilla*.

There is no *constant* appreciable difference in the plumage of the sexes in winter; both have the back in some examples more olive than in others.

Male, summer plumage (China, end of April). Lores, chin, and throat black, abruptly defined against the yellow of the fore neck; above the lores a whitish streak, narrowing as it passes over the eye, and widening again above the ear-coverts; from beneath the eye a broader white streak passes beneath the cheeks to the ear-coverts; chest, breast, and underparts bright sulphur-yellow; head, hind neck, scapulars, and back ashy grey, with the rump, upper tail-coverts, wings, and tail as in winter. The supercilium is more developed in some birds than in others.

A *March* example, with the throat changing to black, shows the colour down the centre of the throat and along the lower edge of what will eventually be the black gorget, which appears to be acquired by a *change of feather*.

Female, summer plumage. Some birds do not assume the black throat; and in those which do "it is not so well defined as in the males" (*Irby*). Ornithologists, as a rule, have not clearly described the plumage of the female, some omitting to make any mention of the throat, others (Macgillivray) saying that the throat "becomes dark grey, mottled with yellowish grey," while others, again, describe the throat as white. Col. Irby, however, explains the matter from personal observation. A female which I have this season watched breeding in Wales had a white throat. A female from Lake Baikal, says Mr. Dresser, has the throat greyish white, with a few blackish feathers on the chin. It is probable that birds in the second year do not change the colour of the throat, while older ones do.

Young. A nestling, just fledged, in the museum of Mr. Seebohm, is in the following plumage:—Head, neck, back, and scapulars brownish slate-grey, with a slight rusty tinge on the hind neck and scapulars; orbital fringe and a postorbital stripe buff; ear-coverts tinged with fulvous; wing-coverts broadly edged with fulvous-grey; secondaries externally margined with whitish; rump dusky greenish, but with a greyish tinge not present in the adult: longer upper tail-covert feathers yellowish; the tail, which is only 1·7 inch long, has the three outer feathers all white, except a streak on the base of the outer web of the third, the remainder blackish, edged with white; throat and fore neck greyish white, deepening on the chest and the upper part of the breast into rusty fulvous, washed slightly with greyish; lower part of breast and belly whitish; vent and under tail-coverts reddish grey, with the longer feathers of the latter part yellow.

Mr. Dresser describes a young bird shot by himself near Baden as follows:—

"Upper parts grey with a slight greenish tinge, the rump greenish yellow, a yellowish-white streak passes over the eye, and under the eye there is an indistinct white mark; wings and tail as in the adult, but the secondary coverts have greyish tips; underparts greyish white with a primrose tinge; lower tail-coverts pale yellow; fore neck marked with greyish; breast washed with pale reddish grey; bill dark brown; legs pale fleshy grey; claws dark brown."

Immature male (Ceylon, January). Iris olive or light brown; bill dark brown, base beneath whitish. Legs and feet fleshy brown.

Hind neck, back, and scapulars ashy grey, pervaded somewhat with olive-brown on the back; the forehead and crown greenish brown; lores blackish; superloral streak fulvous white, becoming whiter as it passes over the eye; a yellowish-white patch just beneath the eye, encompassing the orbital fringe just above it; wings as in the adult, as also the rump and upper tail-coverts; ear-coverts dark grey; chin and throat white, washed on the chin with yellow; chest whitish, with *a just perceptible rusty hue* on it, and gradually becoming yellowish on the breast and flanks down to the abdomen and under tail-coverts, which are fine sulphur-yellow.

Young birds visiting Ceylon are in the above or nearly similar plumage. Some of them have the chest yellower than others, but there is a tell-tale rusty appearance on it which stamps them with the signs of youth.

A female (Asia Minor, February) corresponds with an October Ceylon example; the yellow of the throat is slightly washed with fulvous, giving it a reddish appearance; it is evidently a bird in the 2nd spring, showing that this immature chest-character is not put off until the 2nd year.

Obs. The Western or European form of Grey-and-Yellow Wagtail (*M. sulphurea* of Bechstein) was formerly kept distinct from the Eastern or Asiatic race, the *M. melanope* of Pallas, on account of its longer tail; they have, however, of late years been united, and the species takes the older title of Pallas. The alleged difference consisted in the length of the tail, the European bird being said to measure more than the Asiatic. A widely-collected series has shown that the tail does decrease in length towards China and India; but it likewise does so as we travel westward to the Azores, so that this character was found to be unstable, and the two races have rightly been made into one. The British examples which I have examined vary in the tail from 3·9 to 4·2; those from China

(coll. Swinhoe) vary from 3·3 to 3·8; and Mr. Dresser gives one at 3·9; he states that the Azores birds have shorter tails than any others, averaging 3·5.

Distribution.—The Grey-and-Yellow Wagtail arrives in Ceylon about the middle of September, taking up its quarters along the whole of the northern and western sea-boards. Stray birds arrive at the beginning of the month. Mr. Bligh has seen it as early as the 6th September in Haputale. It remains on the coast for a few days, and then moves into the forests of the northern half of the island, taking up its abode on the sandy beds of all the partially dried rivers. The majority of the birds, however, betake themselves to the hills in the centre and south of the island, resorting to the streams in the coffee-districts and following up the Mahawelliganga and its affluents to their source. About Nuwara Elliya it is very common, frequenting the roadside ditches, the borders of the lake, and every little stream on the plain. It is also found on the Horton Plains about the banks of the Maha Elliya, which, even at that great altitude, is a stream of considerable magnitude. Soon after its first arrival in the Western Province, it, for the most part, quits the low country to the south of the Maha oya, and, with the exception of the northern forests, may be considered a hill-visitant. It leaves again in March.

This Wagtail has, when viewed as being identical with the European bird, a very wide range. I will first consider its habitat in Asia, and then in Europe and Africa. It is a winter visitor to continental and peninsular India, arriving in September and leaving in April. Captain Butler's dates for its migration in the north-west are Sept. 5th to 30th April. It spreads throughout the empire, ascending the hills and taking up its quarters on mountain-streams, as in Ceylon. Mr. Bourdillon says that it is a common winter visitor in Travancore. Many remain to breed in Cashmere and along the Himalayas, which is the only part of India in which it can be said to be stationary. On the eastern side of the Bay it passes through Burmah to Tenasserim, in which province it is sparingly distributed on the more open portions; thence it finds its way across to the islands, where Mr. Davison remarks of it, "Not common on the Andamans or Nicobars;" he procured it on Preparis as late as the 26th of March. Down the peninsula of Malacca it must also wander, as it is found in Sumatra and still further east in Java. In the former island Mr. Buxton lately procured it. It is found throughout China, probably breeding in the northern hilly parts, and is a winter visitor to the east coast, Hainan, and Formosa (*Swinhoe*). Although it is doubtless resident in many regions beyond the Himalayas, yet there is a northward migration to some of them; for Col. Prjevalski, in his 'Birds of Mongolia,' remarks that it arrives at Muni-ul, South-east Mongolia, on the 22nd April. It passes through parts of Turkestan, and is found rarely in the north-western portion in winter up to 4000 feet altitude. Further north it occurs all across the southern parts of Siberia to Japan, where it must be resident, as Messrs. Blakiston and Pryer record it breeding on Fujisan and Tokio. It is found in Trans-Baikal; and Mr. Seebohm procured it, during his travels on the Yenesay, within the Arctic circle. In Palestine it is, according to Canon Tristram, a winter visitor, departing before it acquires its breeding-plumage. It occurs likewise in Arabia, but only on passage.

Turning to Europe, we find Mr. Dresser stating that it is met with there "as far north as the British Isles and Northern Germany;" and in these parts it is mostly a resident, although it moves about, extending its wanderings, as it does in England, after the breeding-season. In Sardinia, Mr. A. B. Brooke says it is common all the year, breeding in the mountains; and Mr. C. A. Wright found it to be a winter visitor to Malta, some few remaining to breed. In Portugal it is said to be common; and at Malaga Mr. Howard Saunders often observed it in winter, and found it abundant in the Sierra Nevada and other ranges, while Col. Irby states that it is abundant in Andalucia in winter and on passage. It is resident throughout the year in Turkey, and visits Greece in the autumn, passing the winter in the Cyclades according to Professor Newton. It is recorded by De Filippi from the Caucasus. It is found on the Carpathian mountains; and its range north of that locality is thus described by Professor Newton:—"This Grey Wagtail does not visit Iceland, the Faroes, or Norway. It has been observed in Heligoland, and a single example is said by Prof. Nilsson to have been shot in the extreme south of Sweden; its most northern occurrence in Germany, near Kiel, was recorded by F. Boie, more than 40 years ago; and in that country it is chiefly confined to the mountainous districts, which only exist in the central and southern parts. It is, however, also said to have occurred once in Posen."

It is found throughout the British Isles, but does not breed south or east of a line drawn from Start Point through the Derbyshire hills to the Tees. It is a summer visitant to Orkney, and occurs at the end of the

summer in Shetland, but has not been met with in the Outer Hebrides, and is rare as a resident in Scotland north of Inverness (*Newton* in Yarrell). In the winter there appears to be a movement from the south of Europe to North Africa. It is, according to Favier, a winter visitor near Tangier, appearing in September and October, and departing in February and March. Captain Shelley writes that it is probably a winter visitor to Egypt, and observes that Dr. Adams met with it in Nubia. In the highlands of Abyssinia it also winters; and Brehm says that it is resident at Mensa. How far south it goes on the west coast of Africa is not very clear; but Professor Newton has met with it in Madeira; and Mr. Godman (Ibis, 1866, p. 96) says that it is resident in the Azores, being common wherever there is water throughout all the islands, and elsewhere (Ibis, 1872, p. 176) remarks that it is abundant in all three of the Atlantic archipelagos.

Habits.—In Ceylon this elegant little bird frequents the banks of rivers, both sandy and rocky streams in the hills, the rivulets flowing through the "Plains" in the upper ranges, and even the roadside drains. It perches on the roofs of houses in the Kandy country, on stumps of trees and on rhododendron and other bushes, perpetually shaking or "balancing" its tail, and uttering its sweet little twittering note, which is very distinct from the louder and coarser cry of the Field-Wagtail. It is very tame in its disposition, getting up on being approached, and flying a little distance down the road or stream, and, if pursued, continues this for a long distance, turning round at the last and returning to where it was first disturbed. Its flight is very undulating, but it is, at the same time, swift, soon carrying the little bird out of sight when it is darting down the steep rocky streams of the Kandyan hills.

To be seen to perfection it must be espied standing on its favourite haunt—an isolated rock amid some foaming torrent in the deep glens of the coffee-districts; here it will rest for an instant under observation, but not long (for it is impatient when watched), "balancing" its graceful form, which looks all the more tiny when contrasted with the huge rocks and dashing waters, and then uttering its cheerful whistle, will dart away; or, if the rock be large enough, it will run to and fro, as if delighting in the wildness of the scene, meanwhile snapping right and left at the insects which swarm around it, or picking up some minute mollusk from the edge of the stream. In England it is equally aquatic in its mode of life, dwelling on brooks, and especially mountain-streams, in Wales or the northern counties. It is occasionally known to take up its quarters near a farm-house; and I have seen it among outbuildings in company with its Pied congener. Jerdon considers that "it has the jerking motion of the tail more remarkably than any other of the group, for it appears unable to keep it motionless for a moment."

Nidification.—In the Himalayas this species breeds in May and June, laying four or five eggs. Mr. Brooks has taken its nest in Cashmere on mountain-streams up to 6000 feet. He writes, "One nest that I found in Cashmere, at Kagan, was placed in a small bush on an island in the Sindh river, about 5 feet above the ground. The situation was that of a finch's nest! It was composed of moss, fibres, &c., and lined with hair, a neat compact nest, and placed in the fork of the branches near the top of the bush. Another nest was placed under a large boulder on the dry bed of the river, and was composed of the same materials." The eggs from these nests are described as "broad ovals at the larger end, and much compressed and pointed towards the smaller end. Typically the ground-colour is yellowish or brownish white, closely mottled and clouded all over with pale yellowish brown or brownish yellow. These markings, always pale dull and smudgy, are somewhat darker in some specimens and lighter in others; almost all have a very fine black hair-like line near the larger end." They vary from 0·68 to 0·73 inch in length by 0·53 to 0·55 inch in breadth (*Hume*).

Near Gibraltar, according to Col. Irby, they breed in April and May, generally in holes of the brickwork of the water-mills, sometimes close to the wheel, or in holes of rocks overhanging streams. In England it likewise builds, as a rule, near water. Professor Newton states that other sites are sometimes chosen, and instances one case in which it was known to build on a shelf in a room, which the bird entered through a broken window. He describes the eggs as "French-white, closely mottled, suffused, or clouded with very pale brown or olive, varying in depth of tint and also in the extent of the ground shewn between the markings; they measure from 0·79 to 0·72 inch by from 0·57 to 0·53."

Subgenus LIMONIDROMUS*.

Differs structurally from *Motacilla* in its slightly stouter bill and shorter tail, as also in its different style of coloration.

Of sylvan and partly arboreal habits, and with a different motion of the tail.

LIMONIDROMUS INDICUS.

(THE WOOD-WAGTAIL.)

Motacilla indica, Gmelin, Syst. Nat. i. p. 962 (1788); Kelaart, Prodromus, Cat. p. 121 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 268.

Nemoricola indica, Blyth, J. A. S. B. 1844, xvi. p. 479; id. Cat. B. Mus. A. S. B. p. 136 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 353 (1856); Jerdon, B. of Ind. ii. p. 226 (1863); Fairbank, Str. Feath. 1875, p. 260.

Limonidromus indicus, Gould, B. of Asia, pt. xiv. (1862); Holdsw. P. Z. S. 1872, p. 458; Swinhoe, P. Z. S. 1871, p. 365; Hume, Str. Feath. 1874, p. 239; Hume, ibid. 1875, p. 142; Armstrong, ibid. 1876, p. 329; Bourdillon, *t. c.* p. 401; Hume & Davison, ibid. 1878, B. of Tenass. p. 364; Ball, ibid. vii. p. 219.

The Black-breasted Wagtail, Jerdon. *Nget Rahat*, Arrakan (Blyth); *Uzhalla-jitta*, Telugu (Jerdon); *Rode Rode*, Malay (Blyth).

Gomarita, lit. "Dung-spreader," Sinhalese (Layard).

Adult male and female. Length 6·5 to 6·7 inches; wing 3·0 to 3·2; tail 2·9 to 3·1; tarsus 2·7 to 2·75; middle toe and claw 0·72; hind toe and claw 0·55; bill to gape 0·7 to 0·75. The largest example in my series is a *female.*

Iris olive-brown; bill, upper mandible dark brown, lower fleshy; legs fleshy, feet washed with brownish, claws brown.

Above brownish olive-green, slightly duskier on the forehead and above the supercilium, which, with the orbital fringe, is whitish; upper tail-coverts, tail, and wings blackish brown, deepening to black on the wing-coverts and part of the secondaries; tips of major and median wing-coverts yellowish white, forming two conspicuous bands across the wing; outer edge of primaries about the centre of the feather, a marginal patch near the tips of the secondaries, margins of some of the longer tertials, and a band at the base of the primaries the same; outer tail-feathers white, except at the base of the inner webs, and the outer edge and terminal portion of the penultimate the same; beneath white, tinged with yellowish on the chest, across which there is a black band succeeded by a black-brown one, incomplete in the centre and generally joined there to the upper; flanks shaded with smoky grey; primary under wing-coverts brownish with yellow tips; long secondary under coverts whitish. The pale portion of the face in some specimens is barred with brownish.

Young (?). I have not seen any very young examples; but a specimen which appeared, on examination of the organs, to be immature is whiter beneath, and has the flanks less dusky than other skins in my collection.

Obs. Mr. Hume gives the following dimensions of specimens from Tenasserim:—" *Male.* Length 6·7 to 6·75 inches;

* This is an isolated form of Wagtail, differing chiefly from *Motacilla* in its habits, and I therefore adopt Gould's term *Limonidromus*. The difference in bill and tail is barely appreciable, for true *Motacillæ* vary *inter se* in this respect; and as to the band across the chest, we have it in some of the Black-and-White Wagtails—for instance, in the African *Motacilla vidua*, in the winter-plumage of *M. alba*, &c. The motion of its tail is a slow lateral one, and not a vertical shaking as in all other Wagtails. This I consider to be its distinguishing characteristic. It was first named *Nemoricola* by Blyth; but this name was changed by Gould to the present, it having been adopted previously by Hodgson for another genus of birds.

expanse 9·5 to 10·0; wing 2·95 to 3·15; tail 2·8 to 3·0; tarsus 0·8 to 0·9; bill from gape 0·7; weight 0·55 to 0·6 oz. *Female.* Length 6·5 to 6·75 inches; expanse 9·4 to 9·75; wing 3·05; tail from vent 2·7 to 2·8; tarsus 0·8; bill from gape 0·75; weight 0·62 oz.

"Legs, feet, and claws pinkish flesh-colour; upper mandible dark brown, lower mandible fleshy pink; irides deep brown."

Distribution.—This charming little Wagtail, which is a denizen of the dry forests of the island, arrives in Ceylon about the first week in October, and spreads through the region north of the central zone, its limit on the western side being the Kurunegala district, in which part I have traced it as far south as the forests lying between Madampe and the Maha oya. Thence it extends round the base of the hills to the eastern forests; but I do not know if it ranges higher than about the foot of the mountains. On the eastern side I have never seen it further down than the country between Vendeloos and Dambool. It is principally located in the central forests to the north of Dambool, and is numerous in the district between Trincomalie and Anaradjapura, in the Seven Korales, and other places north of the mountain-zone.

At Trincomalie I have found it in wood close to the sea-shore. It disappears from the island about the end of March. On the mainland it has a wide eastern distribution, extending from the south of India chiefly up the east side of the peninsula to Arrakan and Pegu and across to China, down the province of Tenasserim to Malacca, taking in the Andaman Islands, and thence to Sumatra, at the west of which island Mr. Davison saw it in Acheen. Mr. Buxton does not seem to have met with it in Lampong at the other extremity; but it is doubtless found in most parts of this comparatively little-known island. Jerdon says it is found throughout the whole peninsula of India, but is common nowhere; he considered it rare in the south of India, and he only procured it himself at Nellore and on the Malabar coast. Mr. Bourdillon records it as a *winter visitor* to the Travancore hills; Mr. Blanford procured it in the Godaveri valley; Blyth states that he obtained it at *all seasons* near Calcutta. In the Irrawaddy delta Dr. Armstrong obtained it in dense forest a few miles from China Ba-keer; and up the country Captain Feilden got it at Thayetmyo, and Mr. Oates in the hills. In Tenasserim, where it is generally distributed throughout the less elevated portions of the province, it was not procured later than April. From the evidence of observers in various parts of India, Mr. Hume affirms that it leaves the country in May, returning in September; but where it breeds is still a mystery, although we may, from a glance at its distribution, surmise that it passes northward through Burmah, and thence perhaps retires to the eastern confines of Thibet, or still further north to the southern part of Mongolia. Here, however, once we pass to the northward of the line of the Himalayas, we are dealing with a region so vast that there would be room in it for numbers of Indian birds to breed unknown to any who have yet explored it; and any conclusions which one might arrive at with reference to our little Wagtail could only be the veriest conjecture indeed. It is noteworthy that Mr. Swinhoe procured it as far north as Pekin, which would decidedly suggest a very northerly breeding-place. Its distribution in India is perhaps as singular as its migration, for it does not seem to be governed by a preference for the is-ombral tracts which Mr. Hume has so well delineated in the useful map he has lately published (Str. Feath. vii.), and in Ceylon it is essentially a dry-district species.

Habits.—The Wood-Wagtail frequents the interior of the forest, being more often seen away from water than near it. I have sometimes met with it on the sandy beds of dry rivers in heavy jungle, but most frequently running about on the leafy ground among trees, or along the edges of paths and roads in the depths of the woods. It is very arboreal in its habits, often flying high up and alighting on the gigantic limb of some huge "Koombook"- or "Palu"-tree, about which it will run with as much confidence as on *terra firma*; it just as often, however, flies off and realights on the ground. Its actions are very graceful, and there was always, to my mind, no little charm in watching its elegant form in the wild and solitary jungles of Ceylon. It is, to a surprising degree, fearless and inquisitive in its manner, and will approach within a few yards of man, quietly tripping over the fallen leaves of the forest, with its characteristic "balancing" and swaying to and fro of its tiny frame, twisting its head awry, and giving out its tinkling cry of *clink, clink,* resembling somewhat that of the Chaffinch; for a moment it will then survey the intruder with quiet curiosity, hopping perhaps on to a low adjacent branch, and after running along it for an instant will realight and

continue its busy chase after the teeming insects of the tropical jungle. He who can then deprive it of its happy existence must have a hard heart indeed! It runs with considerable speed, and darts at its prey as other Wagtails. It sways its body from side to side, thus giving its tail a horizontal motion instead of a vertical, as in other Wagtails.

It is said to be much like the Asiatic Tree-Pipits (*Pipastes*) in its habits; these I have not had the pleasure of seeing in their native haunts, and I cannot therefore venture on an opinion touching its affinities in that direction. It would appear to approach these birds in habits about as much as *Budytes* does the Titlarks (*Anthus*). Its bill, feet, wings, and graceful form, and its gait and deportment are essentially those of a Wagtail. It certainly displays an abnormal character in the black chest-bands; but we see this developed to a small extent in the young of *Budytes*, and its wings-markings are those of this genus exaggerated.

It may often be seen under tamarind- and banyan-trees in the Sinhalese jungle hamlets; and here it was, I conclude, that Layard noticed it scratching among cattle-ordure, for in its accustomed sylvan haunts it has no opportunity of doing this. Mr. Davison thus writes of its habits in Tenasserim:—"It is generally met with in forest-covered ground in small parties, in pairs, or even singly, walking about under the trees and bushes and hunting for insects. Its habits are very similar to those of the Pipits, *Pipastes maculatus*, &c. When disturbed they fly up into the surrounding trees, uttering a sharp Pipit-like note; and there they sit, walk along the branches, or fly from one to the other, shaking their tails all the while. They soon redescend again to the ground when every thing is quiet. This bird combines in its habits something both of the Pipits and Wagtails. Like the former they are found in shady places, walking about in a demure way, uttering now and then a sharp single note; but, like the latter, they usually seize their prey with short sharp dashes, and when disturbed do not generally rise at once, but run on in front of one, taking short runs, stopping every few feet, and shaking their tails violently the while; but, again, when they *do* rise they, Pipit-like, fly up into the trees."

Subgenus BUDYTES.

Differs from *Motacilla* in its longer tarsus, larger feet, and long hind claw. Mostly of non-aquatic habits.

BUDYTES VIRIDIS.

(THE GREY-HEADED FIELD-WAGTAIL.)

Motacilla viridis, Gm. Syst. Nat. p. 962, "ex Brown," Ceylon (1788); Dresser, B. of Europe, pt. 40 (1875); Severtzoff in Dresser's Notes, Ibis, 1876, p. 178; Seebohm, Ibis, 1878, p. 352.

Budytes cinereocapilla, Bp. Comp. List B. p. 19 (1838); Swinhoe, P. Z. S. 1871, p. 364; Hume, Str. Feath. 1874, p. 237; Oates, ibid. 1875, p. 142; Davison & Hume, Birds of Tenass., Str. Feath. 1878, p. 363; Ball, Str. Feath. 1878, vii. p. 219; Cripps, *t. c.* p. 286.

Budytes viridis (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 138 (1849); Kelaart, Prodromus, Cat. p. 121 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 268; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 350 (1854); Jerdon, B. of Ind. ii. p. 222 (1863); Blyth, Ibis, 1865, p. 50; Holdsw. P. Z. S. 1872, p. 458; Shelley, B. of Egypt, p. 129 (1872); Legge, Ibis, 1874, p. 22, et 1875, p. 398; Tweeddale, Ibis, 1877, p. 228.

La Bergeronnette verte, or *Green Wagtail*, Brown, Ill. Zool. pl. 39. fig. 2; *Bergeronnette à tête cendrée*, French; *Wagtail Lark*, Latham. *Pilkya*, Hind.; *Pastro marillo*, Portuguese in Ceylon.

Adult male and female. Length 6·5 to 7·0 inches; wing 3·1 to 3·3; tail 3·0 to 3·1; tarsus 0·9; middle toe and claw 0·8; hind toe 0·4, claw (straight) 0·45; bill to gape 0·65.

Iris dark brown; bill blackish, base of lower mandible whitish or greenish grey; legs and feet blackish; soles yellow.

Male, summer plumage (Futtehgur, 28th April). Forehead, crown, occiput, nape, and sides of the neck, just lower down than the ear-coverts, uniform sombre bluish grey; lores, cheeks, and ear-coverts black, over the *left lore* a white streak, not extending to the eyebrows, above and *behind the right eye* another short white streak; hind neck, back, scapulars, lesser wing-coverts, rump, and upper tail-coverts brownish olive-green, sharply defined against the blue neck; the centres of the upper tail-covert feathers brownish: wings umber-brown; the median and greater secondary wing-coverts and the tertials broadly edged with pale yellowish; the primary-coverts and the primaries with fine pale edgings; inner webs of the secondaries white at the base: tail brownish black, the outer feather all white but the inner half of the inner web, which is brown to within ½ an inch of the tip; the adjacent pair with their inner webs the same, and the outer brown to within ½ an inch of the tip; the dark central feathers edged with olive-yellowish; entire under surface from the chin to the under tail-coverts deep yellow, brightest on the lower parts; extreme point of chin white; thighs brownish yellow, under wing-coverts yellowish.

A *female* has the head not so blue, and a broader yellow eye-stripe.

Male, winter plumage (Ceylon, 29th November). Above dusky olive, greenest on the rump and upper tail-coverts, and pervaded with slate-colour on the hind neck, and slightly brownish on the back; lores and cheeks dark brown: a moderately-defined narrow supercilium, *longer over one eye* than the other; wing-coverts, secondaries, and tertials edged with whitish, tinged on the tertial margins with yellowish; tail as above; chin and throat white, washed with yellow on the fore neck; the under surface pale yellow, not nearly so rich as in summer; chest washed at the sides with brownish.

Other examples have the head browner, and some the back more olive or the opposite (that is, browner); some want the eye-stripe altogether; in one it is present on one side and not on the other; in fact scarcely any two examples are perfectly alike.

A male in change (Colombo, 17th April) has the forehead dusky olive, and the head partly bluish slate, these new feathers appearing among the old greener ones; the back is dusky olive-green, being clothed still with the winter feathers; wing-coverts and secondaries margined with yellowish white; cheeks and lores changing to blackish; a narrow supercilium, which is evidently disappearing from the moulting of the old feathers; chin and throat whitish; under surface pure yellow, with a few whitish feathers down the centre of the breast, the remains of the winter plumage.

Another male (27th October) is in the following singular plumage:—Head and hind neck dusky bluish slate, blending almost imperceptibly into the brownish olive of the back, the feathers on this part being brown at the centre and olive at the margins, those which are abraded are mingled with a few olive-green ones; wing-coverts margined with greyish white; rump pale olive; lores, cheeks, and ear-coverts black; beneath yellow, of medium brightness; chin and along the lower mandible whitish; chest dashed with dark brown, like a young bird; thighs slate-coloured.

This specimen has the appearance of a young bird, were it not for its partially summer-coloured head and total absence of eye-stripe. It is probably a bird which is in the 2nd year, and from some cause has not properly assumed the breeding-plumage in the first season.

A Lapland specimen (29th June: wing 3·2) is not unlike the above (27th October), except that, being in summer plumage, the head is bluer and the back greener, the face and ear-coverts are very black, and there is no supercilium; the under surface not so yellow as in the summer male from Futtehgur.

Young (mus. Seebohm: Yenesay, 8th August, 1877). Scarcely full-grown. Above brownish, tinged with green; some of the feathers on the head and hind neck nearly all black; a whitish supercilium; longer upper tail-coverts blackish; wings dark brown, the coverts very dark and broadly edged with dusky whitish; tertials edged whitish, the tail as in the adult; chin, throat, and lower part of face yellowish white; ear-coverts mixed with black; a blackish moustachial stripe; most of the feathers across the breast black, edged with yellowish; beneath yellowish white; flanks dusky.

Another, shot on the same day, is greener above, wants the black head-feathers, is not so dark on the chest, and has the under surface dusky whitish.

A third example, likewise killed on the same day, has a conspicuous supercilium and above it a black line, a white patch behind the ears, a very bold moustachial streak; chest patched with black; under surface whitish. Wing 3·0.

A yearling (Colombo, 23rd October). In moult to first winter plumage. Wing 3·3 inches. Above olive-brown, mixed on the back with a few olive feathers; the head browner than the back, with imperfect yellowish-white supercilia; rump olive-green; upper tail-coverts dark brown, edged with olive-green; wing-coverts broadly margined as in the nestling; chin and throat white, with the new yellow feathers appearing; fore neck and under surface yellow; chest tinged with fulvous, the feathers partially brown; the sides of the chest almost entirely brown.

This example proves that before migrating the long wing is acquired, together with most of the yellow under surface, and that after arrival the new face- and throat-feathers are donned.

Nearly all immature specimens possess, during winter, in Ceylon the eye-stripe; but it is of varying size, and rarely only present on one side. Many examples, which are apparently young, from the brown marks on the chest, have the head dusky cinereous, and separated from the more olive-colour of the back by a perceptible margin on the hind neck; they have the cheeks, just beneath the centre of the eye, striped with white. In March, the summer plumage is commenced to be acquired by moult. A *female* shot on the 17th is donning a narrow whitish supercilium and *dusky* bluish head; the quills are those of winter, and there is no sign of them being shed, and the old wing-covert feathers are acquiring a yellowish tinge. The *male* above described (17th April), which is in full moult as regards the head and under surface, retains the old quills. I am therefore under the impression that these are not moulted until arrival at the breeding-haunts, and perhaps not until the bird is going to return in the autumn.

Examples may be obtained as late as June with the summer livery not complete; such a one in Mr. Seebohm's museum, dated Yenesay, 4th June, has the head slaty, patched with greenish; the green of the back is lighter than my Futtehgur example. Another from Tromsö, Norway, which is perhaps a yearling in change to breeding-plumage, has the head pure bluish grey, and is brownish olive, like immature birds, on the back.

Obs. This species takes the name of *viridis*, which is much senior to *cinereocapilla*. Specimens from Europe are inseparable from Asiatic ones, although, as a rule, they seem to have darker heads and more sombre-green backs: and I have seen one from Transvaal which I cannot separate from an Indian specimen.

Closely allied to *B. viridis*, and almost entirely resembling it in winter plumage, are two other species of Yellow Field-Wagtail found in India, viz. *B. flava* and *B. melanocephala*. The first-named is scattered over the whole of Europe and most of Africa and Asia. In *summer plumage* the male has a *pale bluish-grey head, a broad white supercilium*, the upper surface pale yellowish green, with the wing-coverts very broadly edged with yellowish; under surface very rich yellow. The female has a brownish head, with broad white supercilium. Wing 3·1 in both sexes; *the bill is slenderer and sharper* than in either of the other species.

B. melanocephala in summer plumage has the head, nape, and face coal-black, without a supercilium, as a rule—though

very rarely, Mr. Brooks says, a thin white line is present. The female has a browner head, with no supercilium. It has the bill stouter than *B. flava*, but not *so deep at the base* as in *B. viridis*. When the three species are laid side by side, the difference in the bill is at once perceptible. The Black-headed Wagtail is found in Eastern Europe, India, and China.

Distribution.—To the student of Ceylon ornithology it must be interesting to know that this widely-spread species, inhabiting the better part of Europe and Asia, and also the north of Africa, was first described from Ceylon, where it is only a winter visitant, from a specimen sent home by that indefatigable collector, Governor Loten, to Brown, who figured it in his 'Illustrations.' From Brown's drawing Gmelin took his description.

It arrives in Ceylon about the 20th of September in small numbers in the young stage; a week or two later a large influx, many of which are old birds, takes place, and by the 10th or 15th October the species is abundantly diffused through all the low country, but is withal more numerous in the maritime portions than far inland. It is less partial to the extremely dry and arid region of the south-east than to other portions of the sea-board; on the grass-lands surrounding the northern tanks of the interior it is plentiful. It does not ascend the hills, either in the centre or the south of the island, not having been recorded in any part above 1000 feet. In the Western and Southern Provinces it commences to pass northwards about the 20th March, migrating chiefly in the mornings, and its numbers decrease gradually through the month of April until the last birds disappear about the 5th of May. This latter date is the very latest in the district of Colombo that I have noted; and long ere this, as will presently be seen, it has begun to pass through some parts of Asia to northern regions.

This Wagtail is also a cold-weather visitant to India, and is spread, more or less, over the whole empire, extending into Burmah and southwards to Tenasserim. Thence it ranges as far as some of the Malay islands, as I observe that Lord Tweeddale includes it in Mr. Buxton's Lampong collection (S.E. Sumatra). It doubtless inhabits, during the season, the intermediate tract of country, the Malay peninsula, down which it must pass to reach Sumatra. In the Andaman Islands it also takes up its quarters; but it is not so numerous as the allied and perhaps more widely-distributed species, *B. flava*. Mr. Hume only records (in his List, Str. Feath. 1874) the procuring of two examples. It extends eastward to China, where it is, according to Swinhoe, found in pairs in the spring; to this region it probably finds its way from Mongolia or from Trans-Baikal, if it ranges so far eastwards. When Jerdon wrote his work on the Birds of India, he included the present and the other two species of Field-Wagtail (*B. flava* and *B. melanocephala*) under the title of *B. viridis*, and said that it was exceedingly abundant in every part of India. Since that time, however, Messrs. Anderson, Brooks, Hume, and others have paid much attention to this group (which is somewhat puzzling in winter plumage) and have demonstrated the fact that all three species inhabit India, so that they have been heretofore confounded with one another. It transpires accordingly that *B. flava* is quite as common, if not commoner, in some parts of the empire than our bird. There is no reason why it should not occur in Ceylon, although it does not seem to have generally such a southerly range as the present. As regards various observers in India, we find that Dr. Fairbank records it from Ahmednaggar, and that Mr. Davidson says it is common in the Deccan. In the district of Furreedpore it is numerous during the cold weather. Captain Beavan writes that it is very "abundant at Barrackpore in the beginning of the cold weather;" he likewise found it numerous at Umballah. Further south, on the east side of the peninsula, Mr. Hume records it from Sambalpur. In Central India, I understand, it is common in localities. Mr. Anderson sent it to me from Futtehgur, where he also procured its two allies above mentioned. In the north-west I observe that neither Captain Butler nor Mr. Hume record it from the Guzerat district; but here it has, no doubt, been overlooked, as it must diverge to that part in migrating into India. In Sindh, it is, however, common, as also at the Sambhur Lake. In Pegu it is abundant, according to Mr. Oates, and it is likewise common in Tenasserim, and has occurred as high as 3000 feet in Karennee. In Turkestan it occurs in passage, according to Severtzoff, but does not breed there. Dr. Finsch met with it in the valley of the Irtisch in Western Siberia; and Mr. Seebohm found it on the Yenesay, where it breeds as far north as $69\frac{1}{2}°$ N. lat., thus ranging into the Arctic circle; it arrived, he says, in the valley in great numbers on the 5th of June. It passes through Palestine in April on its way north, perhaps from Egypt or Arabia. Canon Tristram thus writes of it:—"When at Jericho, April 14th, I observed a large flock of *Budytes cinereocapilla*, evidently on their migration; they remained but one evening, and I secured several specimens, all of this form; on the next morning the flock took its departure for the north."

In Egypt it remains, according to Captain Shelley, throughout the year, and is there the most abundant of the Yellow Wagtails. It is found in North-western Africa, likewise inhabiting, says Col. Irby, both sides of the Straits of Gibraltar in great abundance. It arrives on the north side about the 20th of April, and leaves again in August and September. Mr. Saunders procured it in Southern Spain, and it is also found in Malta and Corfu. It inhabits Germany, and is common in Scandinavia, Lapland, and Finland; according to Sundevall it has been found as far north as Hammerfest. There has been no evidence, as yet, of its having occurred in England, although its near ally (*B. flava*) has many times been procured there. This latter species has been recorded from Transvaal and Damara Land, but the present bird has likewise occurred in South Africa, for I have seen a specimen in Mr. Seebohm's collection, procured by Mr. Andersson, which cannot be separated from unmistakable Ceylon examples of *B. viridis*.

I omitted to remark above that it visits Borneo, where it has been obtained in several localities, and in Sarawak has been shot as early as the 10th October. Horsfield records it from Java, Wallace from Moluccas, and Lord Tweeddale from Celebes; Gray notes it from Timor.

Habits.—This species frequents open lands covered with short grass, pasture-grounds, newly-ploughed paddy-fields, bare pasture, and so forth, resorting, whenever it can, to the vicinity of cattle, round which it congregates in little troops of three or four to catch the flies which torment oxen to such a degree in hot climates. Hundreds of these Wagtails are always to be seen in the season on the Galle face, Colombo, running to and fro, and darting along the ground in quest of food; little flocks of them associate in scattered company, and some are seen trooping across the road, or running along the curb-stone of the promenade, while others take up an elevated position on fragments of cattle-ordure, and plume their sober attire, making up, together with our Titlarks and Dotterels (which latter are generally to be found there after a heavy night's rain), quite an animated picture of bird-life. They are restless birds, constantly on the wing; but their flight is not so darting nor so undulating in character as that of the more graceful *Motacilla melanope*. They roost in long grass, resorting from far and wide to some chosen ground just before sunset, and starting back to their haunts in large flocks on the following morning. It was for years a matter of conjecture with me as to where all the Wagtails and Pipits which frequent the "Galle face" went at night; some time before sunset they became restless, and I used to observe that one by one they would take a longer flight than usual, and then mounting in the air, would fly off in the direction of the Pettah. About six, or a little before, the next morning they were to be seen returning in twos and threes, flying over the fort and making direct for the Galle face. It was not until shortly before I left Ceylon that I saw, on several occasions, great numbers of these birds coming from the south and settling down in the Mutturajawella swamp just before sunset; and I therefore conclude that these birds came from the environs of Colombo, as well as from other grass-lands in the neighbourhood. This Wagtail, to a great extent, catches its prey, consisting of small flies, while they are flying, darting at them very quickly from its terrestrial perch; it also picks up small terrestrial insects.

This species and its allies, in their non-aquatic habits, as well as in the structure of the leg and foot, show their affinity to the Pipits. In Ceylon I have never seen it near water; large flocks may be observed in the interior collected in newly-ploughed paddy-fields, where they procure a good supply of food from the upturned soil. In their breeding-haunts they would appear to resort to moist or marshy places. At Gibraltar Col. Irby says it keeps to marshes, nesting in the vicinity of water in grass and herbage and sometimes among sedges.

Nidification.—Our Indian birds, which breed in Siberia, would appear to nest in June or July; for Mr. Seebohm's nestlings, which he procured at the Yenesay on the 8th of August, were scarcely full-grown. In Southern Spain, according to Col. Irby, it lays at the end of April; but I am unable to give particulars concerning its nest and eggs.

Genus CORYDALLA*.

Bill straight, stouter and higher at the base than in *Motacilla*; tip slightly decurved. Nostrils as in the last genus; rictal bristles well developed. Wings long, pointed, the 1st, 2nd, and 3rd quills subequal and longest; tertials not exceeding the primaries. Tail shorter than the wings, even or emarginate; the outer feathers shorter than the others. Tarsus long, smoothly scutellate in front; toes moderately long, with the hind claw lengthened, in some species to a considerable degree.

Plumage pale-margined above, and more or less spotted or striated on the chest.

CORYDALLA RICHARDI.

(RICHARD'S PIPIT.)

Anthus richardi, Vieill. Nouv. Dict. xxvi. p. 491 (1818); Gould, B. of Europe, pl. 135; Blyth, Cat. B. Mus. A. S. B. p. 135 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 268; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 355 (1854); Newton in Yarrell's Brit. B. p. 598 (1874); Dresser, B. of Europe, pt. 26 (1874); Irby, B. of Gibraltar, p. 110 (1875); Seebohm, Ibis, 1878, p. 343.

Corydalla richardi (Vieill.), Vigors, Zool. Journ. i. p. 411 (1825); Kelaart, Prodromus, Cat. p. 121 (1852); Jerdon, B. of Ind. ii. p. 331 (1863); Swinhoe, P. Z. S. 1871, p. 366; Holdsw. P. Z. S. 1872, p. 458; Brooks, Str. Feath. 1873, p. 358; Hume, ibid. 1874, p. 239; Legge, Ibis, 1875, p. 398; Scully, Str. F. 1876, p. 152; Armstrong, *t. c.* p. 330; Prjevalski, B. of Mongolia, Rowley's Orn. Miscell. ii. p. 195 (1877); Hume & Davison, B. of Tenass., Str. Feath. 1878, p. 365; Ball, ibid. vol. vii. p. 220; Cripps, *t. c.* p. 288.

Corydalla chinensis (Bp.), Swinhoe, P. Z. S. 1871, p. 366.

Slender Lark, Latham; *Large Titlark*, Europeans; *Marsh-Pipit* of some writers. *Sairam*, lit. "Singing-bird," Turkestan, Scully; *Pastro marello*, Portuguese in Ceylon; *Pulla puraki*, lit. "Wormpicker," Tamils; also *Meta kālie*, lit. "Long Legs."

Gomarita, Sinhalese.

Adult male and female. Length 7·5 to 7·9 inches; wing 3·6 to 4·0; tail 2·9 to 3·2; tarsus 1·2 to 1·3; middle toe and claw 1·07 to 1·18; hind toe 0·6, its claw 0·65 to 0·82; bill to gape 0·75 to 0·85.

These dimensions are taken, as is the invariable rule in this work unless otherwise stated, from Ceylon birds. There is, as will be seen, much variation in the length of the hind claw; but it has always the same *straight* character, differing in that from *C. striolata.*

Iris pale brown or light hazel; bill, upper mandible dark brown, lower fleshy with dusky tip, inside of mouth yellow; legs and feet fleshy, the toes brownish and the soles yellow, claws brown.

* Structurally this genus is but little different from true *Anthus*. It was adopted by Vigors for the species first to be noticed, and has been adopted generally for the allied hair-brown fulvous-margined Pipits, *C. richardi*, *C. striolata*, *C. rufula*, and *C. malayensis* of the Indo-Malayan region. I retain the generic term here because these birds appear to differ from true *Anthus* in not having a marked breeding-plumage. Blyth says that they only moult once; but this is erroneous, for I have detected examples of both the commoner Ceylon species acquiring new feathers in spring, although they do not shed the quills and rectrices at that season.

Winter (Ceylon). Above sepia-brown; head and back more or less deeply margined with ochreous grey or brownish buff, the edgings on the back of the neck generally paler than elsewhere; wings and tail deeper brown than the back; the tertials, major wing-coverts, and centre tail-feathers boldly margined with brownish buff; outer primary with a white edge; lateral tail-feathers white, except at the base of inner web; the next pair with more brown on the inner web, and the next with a white outer edge; above the eye a broad streak of buff; lores and face mingled ochreous and brown, with a dark streak on the lower part of the cheek; beneath buff-white, the chin paler than the fore neck; a dark stripe on each side of the throat; chest and flanks washed with fulvous, the former with dark centres to the feathers; under wing buff, the longer feathers rufescent at the tips.

Obs. This species is said to have a summer plumage which is darker and more distinctly edged than that of the winter bird. I have not been able to detect much difference myself. An example shot in May at Galle, just on the point of leaving for northern parts, is no darker than winter specimens, although the edgings of the upper-surface feathers are more ochraceous; new feathers are being acquired on the chest, which are more fulvous than the old ones. One autumn Heligoland example is *somewhat* darker than my winter series from Ceylon; but this may be a local peculiarity.

Young (nestling: Yenesay, mus. Seebohm). Centres of head-feathers very dark brown, the margins rufescent; back-feathers narrowly edged with whitish; wing-coverts very broadly margined with whitish and rufous; outer tail-feathers, with the base of the inner web blackish, sloping to a point at an inch from the tip, the adjacent pair blackish, the tip of the inner web white, running up the web; ear-coverts fulvous; a *broad, dark, complete stripe* down each side of the throat; the chest and fore neck with broad, blackish, central, drop-shaped markings.

Immature birds in Ceylon have the legs duskier than the adults; lores not so dark; the edgings of the upper surface paler, the centre of the back not presenting that uniform appearance which old birds have; the throat less fulvescent, the stripes on each side conspicuous, and the striæ of the chest more pronounced.

Obs. Examples of this Pipit vary somewhat according to locality. Some specimens from China are particularly dark; and the hind claws and bills of these Eastern birds seem to be shorter than those from Europe and India. In five specimens the claw varies from 0·4 to 0·7 inch; the wings from 3·7 to 3·8; tail from 3·3 to 3·4; bill from gape to tip 0·75 to 0·8. Two adults from Heligoland, with shorter wings (3·5 to 3·6 inches), measure each in the bill 0·8, and in the hind claw 0·62 and 0·7 respectively. The chests in the China birds have the same fulvous wash on the chest and the same softened brown stripes that our winter birds in Ceylon have. A specimen from Siam corresponds exactly with these Chinese birds.

Dr. Armstrong gives the dimensions of examples shot in the Irrawaddy delta as—wings 3·45 to 3·7 inches, bill from gape 0·8 to 0·85; Mr. Cripps of Furreedpore specimens—length 7·75 to 8·16 inches, wings 3·5 to 3·75, bill from gape 0·76 to 0·86, hind claw 0·7 to 0·83. A Yarkand bird shot by Dr. Scully measures—length 8·0 inches, wing 3·95, tail 3·3, bill from gape 0·85. The majority of these Indian birds appear to exceed slightly those I have examined from Europe; but I have not seen a large series of the latter. Mr. Brooks, in his table of measurements of this and *C. striolata* (Str. Feath. i. p. 360), gives the hind claw at 0·65 to 0·7.

Distribution.—This large Pipit is migratory to Ceylon, arriving at the beginning of October and departing as late as the middle of May, about which time I have procured examples in the Galle district. It is widely diffused through the low country, affecting chiefly the maritime regions. It is particularly numerous on the pastures lying on both banks of the Virgel, and likewise on the open lands and grass-cheenas to the south of Batticaloa. In the west it is abundant at Puttalam, Negombo, Colombo, and other places on the coast. In the south it is frequently met with about Galle and Matara, but becomes scarcer towards the east. It is probable that the large species of Pipit I observed in the Hambantota district belonged to this species and not to *C. striolata.* In the Central Province it inhabits some of the lower highlands and patnas; but I do not know that it ranges to any altitude. It is common all through the Jaffna peninsula and in the islands adjacent.

We may safely assume that this Pipit is only a cold-weather visitant to the whole of India, as Mr. Hume states; though it breeds at Ladak it does not do so at Simla, nor, I conclude, at any station on the southern slopes of the range. Jerdon sketches out its distribution in India as follows:—"It is found from Nepal and the Himalayas to the extreme south; more rare in Southern India, especially in the Carnatic, but tolerably common, indeed abundant, in Lower Bengal. It is also found in Burmah and other countries to the eastward." As regards the various localities here referred to, we find that of late years Mr. Ball records

it from Bardwan, Nowargarh, and Karial, and that Mr. Cripps says that it is common in Furreedpore. At Assensole, on the borders of the province of Chota Nagpur, it is, according to Mr. Brooks, not so common as its two congeners next referred to here. We do not find it recorded from the hill-districts in Southern India; but this is only natural, as it is essentially a bird of the low country. In the dry north-west of India it does not seem to locate itself at all, as it is not found in Sindh or Rajpootana; in fact, as regards this part of Asia, it has more of an easterly than a westerly distribution. On the opposite side of the Bay it evidently locates itself near the coast, as Mr. Oates did not find it up country in Pegu, whereas Dr. Armstrong says that it is extremely abundant in the paddy-fields near Elephant Point in the Irrawaddy delta; it likewise occurs in the maritime province of Tenasserim, in all cultivated and open lands throughout it. In the Andamans it was procured at Pt. Blair in April, but was not met with so far south as the Nicobars. It has been met with in Siam, and is found throughout China in the winter, also in Hainan, and rarely in Formosa.

Turning northwards now, in order to trace out its summer quarters, I observe that Dr. Scully states that it is a seasonal visitant to the plains of Eastern Turkestan, where it breeds; he observed it there in June and July, but not in winter. Further east, in the little-known regions which he explored, Col. Prjevalski states that it breeds in limited numbers at Kan-su in Mongolia, and that it is tolerably abundant at Lake Hanka from the end of April until the beginning of September. It breeds on the steppes, avoiding the tall thick grass of the marshes. Mr. Seebohm found it breeding in great numbers on the Yenesay, and Dr. Dybowski met with it in Dauria. Severtzoff did not meet with it in Western Turkestan, nor does it appear to inhabit Palestine, although it is said to visit Smyrna by Dr. Krüper. As regards North-eastern Africa, Shelley says nothing of it in Egypt, nor does Mr. T. Drake mention it as having been seen by him in Morocco. On the European side of the straits, however, we have Col. Irby's evidence as to its occurrence at Gibraltar in passing in April, from which we infer that it must also be found on the African side too. Its distribution in Europe is somewhat noteworthy, for it seems to confine itself to the countries just on the north of the Mediterranean, on the east of which it inhabits South-eastern Russia and on the west France, straying into England and up to Heligoland, and thence into Sweden and Norway (where it has very rarely occurred); whereas in the intervening region of Central Europe it is almost unknown, it having only once been met with there, and that near Vienna. Mr. Saunders obtained it at Malaga; and one of the first few examples ever procured came from the Pyrenees. In France and Lombardy it is well known; in fact it was described by Vieillot from specimens procured in Lorraine in 1815 by M. Richard; while in Lombardy it is said by Signor Bettoni to be a characteristic species. To England it is of course a visitor, arriving in autumn and departing in spring; and since the first specimen made known to science was obtained near London in 1812, about sixty have been recorded. It has chiefly, according to Professor Newton in his edition of Yarrell, occurred in the southern counties from Kent round to Cornwall, even having occasionally found its way to the Scilly Islands. Mr. John Hancock records three examples in his interesting catalogue as having occurred in Northumberland, and it has also been procured in Shropshire and Staffordshire.

Habits (Ceylon).—This Pipit is usually found consorting in scattered company with the common Titlark, *C. rufula*. It frequents pastures, particularly those covered with short grass or on which cattle are much fed, bare ground in the Jaffna peninsula, cheenas in the forest, and marsh-land. To the latter sort of locality, however, in Ceylon it is certainly not so partial as to the barest ground, although it *has* been named the "Marsh-Pipit." I have generally found it in long grass on wet marshes, either just after its arrival or before leaving the island for northern climes. It is a handsome bird in its carriage, holding itself erect, running swiftly, and frequently mounting on to some little eminence, where it stands pluming itself, and in this attitude is very apt to deceive the eye as to its size. It has a soft-sounding yet louder note than *C. rufula*, and constantly utters it, both on the ground and when flying with its rapid undulating flight from one spot to another. It is as fond of dusting itself on roads as the next species, and on the Galle face, Colombo, where it is common, becomes discoloured with the red *Kabook* soil. It feeds on worms and grasshoppers, and often seizes a passing butterfly or insect on the wing.

Mr. Brooks, who has devoted much attention to this species and *C. striolata*, has some interesting notes on his observations of it at Assensole in Bengal. He remarks that there it is particularly shy and difficult to shoot, and that its note is a soft double chirp, reminding one strongly of the note of a Bunting. The

places it "frequented were low grounds occurring below jheels or *talaos*; the water constantly percolating through the reservoir-bank kept the low grounds adjacent rather damp, and in many places quite wet. Over a greater part of this low ground, the rice-crop having been gathered, there now grew a small vetch with blue flower, and in these vetch-fields the large Pipit of which I am speaking delighted. Before retiring among the vetches to feed they sat for some time, as a rule, upon the little bunds which divide the fields; and when they did this I found the best plan was to wait till the lookout was over and the birds had retired among the crops to feed. It was then possible to creep up within shot." In Ceylon the Marsh-Pipit exhibits none of this shyness when inhabiting public resorts, but is, on the contrary, very tame. In wet weather in the Eastern Province I have, however, found it somewhat wary in marshes. Mr. Seebohm observed that it hovered like a Kestrel at its great breeding-grounds on the Yenesay. In Furreedpore it is said to frequent fields of peas, linseed, &c.; and, according to Jerdon, it is always found "in swampy or wet ground, grassy beds of rivers, edges of tanks, and especially wet rice-fields, either singly or in small parties."

Nidification.—There is not much known about the nesting-habits of this fine Pipit. It is probable that our birds all breed in Thibet and Turkestan. Col. Prjevalski, the celebrated Russian traveller and ornithologist, found it breeding in Kan-su, where it arrives in May; and Dr. Scully considers that it hatches its young about the beginning of July in Eastern Turkestan. In Northern Asia Mr. Seebohm shot the young in August on the Yenesay, so that its breeding-season throughout Central Asia must be June and July. Concerning its breeding in Dauria, Mr. Dresser writes as follows:—"Dr. Dybowski writes (J. f. O. 1868, p. 334) that it is common in Dauria, and remains there to breed; but he gives no information as to its habits or nidification, excepting that he found its nest, and that it deposits five or six eggs . . . It is curious that, although this bird has been so frequently met with in various parts of Europe, and must breed there (for I have before me European-killed specimens in young plumage), there does not appear to be any reliable instance on record of its nest having ever been taken in Europe; and, in fact, next to nothing is known respecting its nidification. I have a clutch of five eggs collected by Dr. Dybowski in Dauria; but they were sent to me without the nest, which I am therefore unable to describe." These eggs are described as being greyish white, closely spotted with greyish olive, and as measuring 0·9 to 0·78 by from 0·67 to 0·62 inch.

CORYDALLA RUFULA.

(THE COMMON PIPIT.)

Anthus rufulus, Vieill. Dict. d'Hist. Nat. xxvi. p. 494 (1818); Blyth, Cat. B. Mus. A. S. B. p. 135 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 268; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 356 (1854).

Corydalla rufula, Kelaart, Prodromus, Cat. p. 121 (1852); Jerdon, B. of Ind. ii. p. 232 (1863); Holdsw. P. Z. S. 1872, p. 458; Hume, Nests and Eggs, ii. p. 384 (1874); Ball, Str. Feath. 1874, p. 416; Hume, ibid. 1875, p. 142; Brooks, *t. c.* p. 252; Butler & Hume, *t. c.* p. 490; Fairbank, Str. Feath. 1876, p. 260; Armstrong, *t. c.* p. 330; Bourdillon & Hume, *t. c.* p. 401; Hume, *t. c.* p. 458; Fairbank, ibid. 1877, p. 407; Hume & Davison, B. of Tenass., ibid. 1878, p. 366; Ball, ibid. vii. p. 220; Cripps, *t. c.* p. 288.

The Indian Titlark, Jerdon. *Rugel*, Hind.; *Chachari*, Hind. at Monghyr; *Gurapa-madi pitta*, Telugu; *Pastro marello*, Portuguese; *Meta kālie*, lit. "Long Legs," Tamils.

Adult male and female. Length 6·2 to 6·75 inches; wing 3·0 to 3·3; tail 2·5; tarsus 1·1; middle toe and claw 0·8; hind toe 0·4, claw 0·45 to 0·52; bill to gape 0·75 to 0·8. This species varies much in size. The claw is straight, like that of *C. richardi.*

Iris dark brown, olive-brown, or earth-brown; bill, upper mandible dark brown, gape fleshy, lower mandible fleshy, with dark tip; legs and feet fleshy grey, joints darkish, claws brown.

In general character this bird is very similar to Richard's Pipit, of which it is a miniature, differing structurally also in its shorter hind claws. The margins of the upper plumage are perhaps, as a rule, more clearly defined than in the larger bird, and the broad edgings of the wing-coverts and tertials more tawny in hue; but, at the same time, the character of these markings is subject to variation; the penultimate has the brown portion of the inner web, as a rule, more extensive than in the large bird; the buff supercilium, ear-coverts, and cheeks are similar, but the streak at the side of the throat is, in low-country birds, less clearly defined; chest and flanks washed with fulvescent, the former streaked, and the under tail-coverts tinged, with buff, as in *C. richardi.*

Some individuals from the patnas in the upper hills are very tawny in general hue, and have the tail darker than in low-country birds; the stripe running down from the bill on each side of the throat is also bolder, and the bill very large in some,—in a Horton-Plains specimen it is 0·8 inch, quite as large as any Richard's Pipit; the wing measures only 3·3, and the hind claw 0·5; the anterior claws are very long, the middle one 0·26. In fact, had I large series exhibiting throughout the same character, it would, I think, be justifiable to separate the hill-race as distinct. An example from Lindula patnas measures—wing 3·2, hind claw 0·52.

The edgings of the feathers above are very ochraceous, as is also the entire colour of the under surface.

Young. Immature birds of the year scarcely differ from adults; the feathers are perhaps rounder on the head, as in the Larks, and the centre tail-feathers rather conspicuously edged with buff.

This species moults completely in September and October, but only the clothing-feathers before breeding. It has a strong propensity towards albinism: examples may occasionally be seen with two or three white feathers in the tail; and I possess one in which the terminal portions of all the clothing-feathers above, most of the central tail-feathers and tertials, and the entire occiput are *pure white.*

Obs. The same variation in size appears to exist in continental members of this species; and this fact exposes a propensity in its nature which makes it unsafe to try any expedient of dividing it into races. Many such uncertain birds exist, and they are, perhaps, better left alone, to enjoy an undisturbed and intimate relationship with one another. Mr. Hume, in dealing with Mr. Bourdillon's specimens from the Travancore hills, says that local races differ as much as those of *Alauda gulgula*, the Indian Sky-Lark. In the southern examples, he remarks, the bills are longer and slenderer, the hind claw shorter, and the markings of the upper surface better defined and more pronounced. As regards size from various localities, Dr. Armstrong records the wing of an Irrawaddy specimen

as 3·27, and Mr. Cripps that of a Furreedpore example 3·08 inches, both being males. Jerdon, generalizing from India, fixes the wing dimension at 3·0 to 3·25.

C. malayensis, the Malay Pipit, is the representative of this species in that peninsula. It is closely allied, differing, according to Mr. Hume, in the darker upper surface, more strongly marked spotting of the breast, stouter bill and feet: I have not seen any examples; but it must be remarkably close to our hill-bird, and can at best be only looked upon as a *subspecies*. *Male*, wing 3·5; *female*, wing 3·1 to 3·15.

Distribution.—The Common Pipit, or Indian Titlark, is one of our most familiar birds, being distributed over the whole island, and almost as abundant on the lofty lying patnas and "plains" of the Nuwara Eliya plateau and other elevated regions of the hill-zone as on the plains of the north. It is, however, scarcer at the Horton Plains than at the Sanatarium, Elephant Plains, or the Agra patnas, that upland region being probably too cold for it. It moves about in districts exposed to the force of the monsoons, seeking shelter at that time in more secluded localities than its favourite open lands on the sea-coast. There is a marked increase in its numbers on open places near the sea-coast during the N.E. monsoon, owing to its retiring in the breeding-season to grassy places in the interior. This may be plainly observed by noticing it throughout the year at the Galle face.

It is abundant in most parts of India, except, perhaps, in the north and north-west portion of the empire. Jerdon remarks that it is numerous from "the Himalayas and Nepal to the extreme south, more rare in Southern India, especially in the Carnatic, but tolerably common and abundant in Lower Bengal."

As regards the south, however, it is found in Ramisserum Island, in the hills of Travancore, and in the Palani ranges. Further north, in the Deccan, it is common, and also on the hills, according to the same authority. The same is true in the open parts of Chota Nagpur; and Mr. Ball likewise records it from various places between the Godaveri and the Ganges, from Calcutta and the Satpura hills; in Central India it is found, and, in fact, it breeds, says Mr. Hume, all over the plains. In the north-west its distribution is local. Mr. Adams records it as common at the Sambhur Lake; and Captain Butler says it is likewise so in the plains round Mount Aboo in the cold weather, though it does not ascend the hills; it, however, sparingly remains in that district throughout the year, as subsequently he found it breeding at Deesa. Mr. Hume says it is common at Ajmere, but not found at Jhodpoor, or in Sindh, Cutch, and Kattiawar. In the Himalayas Mr. Brooks procured it in the narrow part of the Bhagirati river above Mussoori; and Mr. Hume says that it builds up to 6000 feet elevation. It is abundant in parts of the Irrawaddy delta according to Dr. Armstrong, but is rare in Pegu, where Sir Arthur Phayre procured it in the Tongoo district. In Tenasserim it is "a permanent resident in the more open and cultivated tracts throughout the province," not ascending the higher hills. Mr. Davison remarks that "there is not a bit of open land anywhere about Moulmein, Tavoy, or Mergui where numbers may not be seen." It has not been found in the Andamans, if the Marquis of Tweeddale's identification of *C. striolata* in Lieut. Wardlaw Ramsay's collection was correct, which I have no doubt was the case. It is replaced to the south of Tenasserim by the Malaccan form, *C. malayensis*.

Habits.—This tame bird frequents fields, esplanades in towns, pastures and open ground of all sorts, ploughed paddy-land, and bare patnas in the hill-districts. It is fearless in its disposition, taking no notice of man, but merely moving out of his way or running leisurely before him. It rises with a two-syllable note, and is capable of taking long-sustained flights, which are noticeable in its evening passage from the Galle face over Mutwal to the Mutturajawella swamp, where it roosts in great numbers in sociable company. It associates in flocks at some seasons of the year, notably before pairing in June, and is then very restless in its habits. Both this and the last species, adapted by nature to open and bare localities, are capable of sustaining the powerful midday rays of a tropical sun without any apparent inconvenience; and when all other insessorial birds are seeking the cool shade of green foliage, or panting with heat, these salamander-like little birds may be noticed running on the burning soil, or quietly feathering themselves on some half-baked clod! It feeds on worms and various terrestrial insects, and likewise partakes of small grass-seeds. It is in a constant state of moult in the autumn.

Mr. Davison remarks concerning this species:—"It is a very familiar and tame bird, running about the gardens and along the paths and roads, and even coming to within a foot or two of one's door. Though

numbers are seen within a very small circumference, yet they all seem to act quite independently of one another; their flight is undulating, and they utter as they rise and during flight a short sharp note. I have seen them often rise into the air, however, for a few moments, sing a sort of song, and then descend." They do not all sing thus as a constancy when breeding, like the Bush-Larks; but I have on one or two occasions seen them rise and make a poor attempt at a Pipit-like warble. Jerdon likens it to a "mere repetition of one note, during its descent from a short flight of a few feet from the ground."

Nidification.—This species breeds in the west and south of Ceylon during May, June, and July, placing its nest in a depression in the ground, under the shelter of a tussock or small tuft of herbage. It is generally well concealed or artfully situated, so as to escape observation, for it is seldom found. In shape it is a shallow cup, the bottom being thick and tolerably compact, while the edges are fined off to correspond with the grass at the surface or edge of the hollow in which it is placed; it is made of roots, dry grass, stalks of plants, &c., and lined with fine grass, hair, or very small roots, the egg-cavity being about $2\frac{1}{4}$ inches in diameter. The eggs are usually two or three in number, of a whitish or greenish-white ground-colour, speckled and spotted all over, but chiefly at the large end (where the markings unite to form an irregular zone), with greenish brown, light brown, or purplish brown, over which, in some, are more sparingly distributed blots of dark or inky brown. Some eggs are openly marked all over with dark brown without the lighter wider spottings. In size they vary from 0·76 to 0·89 inch in length by from 0·56 to 0·64 inch in breadth. The female sits closely to preserve her eggs from the attacks of vermin and lizards; and incubation lasts from 12 to 14 days.

In India the breeding-season lasts from March until July, April being the favourite month. The nests are made of grass and roots, and lined scantily with finer roots. Some nests are almost entirely composed of roots, and they are usually placed under the shelter of a tuft of grass.

The eggs are said to be three in number, and are described as "typically of a brownish or greenish stone-colour, thickly streaked, clouded, and streakily spotted with dull brownish and purplish red, and sometimes with brown of different shades, or brown intermingled with pale purplish grey;" the markings have a tendency to become confluent at the large end. In size the eggs vary from 0·75 to 0·86 inch in length, by 0·57 to 0·63 inch in breadth (*Hume*).

CORYDALLA STRIOLATA.

(THE LARGE MEADOW-PIPIT.)

Cichlops thermophilus, Hodgs., Gray's Zool. Miscell. 1844, p. 83 (without description).
Anthus striolatus, Blyth, J. A. S. B. 1847, xvi. p. 435; id. Cat. B. Mus. A. S. B. p. 136 (1849); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 268.
Corydalla striolata (Bl.), Kelaart, Prodromus, Cat. p. 121 (1852); Jerdon, B. of Ind. ii. p. 233 (1863); Holdsw. P. Z. S. 1872, p. 458; Brooks, Str. Feath. 1873, p. 359; Ball, ibid. 1874, p. 417; Fairbank, ibid. 1876, p. 260; Hume & Davison, B. of Tenass., Str. Feath. 1878, p. 366; Ball, ibid. vii. p. 220.
Anthus thermophilus (Hodgs.), Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 356 (1854).
The Mountain-Pipit, Kelaart.

Adult male and female. Length 7·1 inches; wing 3·6; tail 2·8; tarsus 1·05; middle toe and claw 0·8; hind toe 0·43, *claw* 0·5; bill to gape 0·75 to 0·8. The tarsus and toes are short, and the hind claw *much curved* in this species. The bill is also small for the bird.

Iris brown; bill, upper mandible dark brown, lower fleshy yellow, tip dusky; legs and feet fleshy yellow, claws dusky.

Ceylon (October). Above sepia-brown, the feathers more narrowly margined with a paler hue than *C. richardi*, giving the edgings a more conspicuous appearance than in that species; the penultimate rectrice has more white, and its shaft is also white near the tip; median and greater wing-coverts broadly edged with *whitish*, forming two bars across the wing; tertials and secondaries edged with tawny; primaries pale-edged, the outer edge of the 1st white; from the nostril to the ear-coverts, the upper feathers of which are brown, a buff streak; beneath fulvescent whitish; throat and abdomen the palest; a series of spots forming a line down the sides of the throat and spreading over the chest, which is lightly washed with greyish buff; the flanks are paler than in the other two species.

Obs. The above is a description of the only Ceylonese example in my collection, about the identification of which I have no doubt. I am therefore unable positively to say whether it is a fully adult bird. It, however, corresponds well with specimens collected by Mr. Brooks at Dinapore, and with a skin in the late Mr. A. Anderson's collection; and therefore if due regard be paid to the peculiarities in the plumage of this specimen, taken in conjunction with the well-marked character exemplified in the short and *curved* hind claw, the species ought to be correctly identified by my readers in Ceylon. The hind claw varies in length in the last species, but it is always remarkably straight, or, more correctly speaking, *very gently* curved; whereas in the present species it is fairly curved, slightly more so than in the Common Pipit next to be considered. Mr. Brooks's specimens are all characterized by the same slender small beak; the chests are marked with clearly-defined, small, rather pointed stripes, which have a different appearance altogether from the softened down striæ in the last; the centres of the back-feathers are darker brown. Four examples from Dinapore measure respectively as follows:—wings 3·5, 3·6, 3·6, 3·6 inches; tails 3·5, 3·5, 3·5, 3·7; hind claws 0·5, 0·55, 0·4, 0·52. Mr. Anderson's specimen measures—wing 3·6 inches, hind claw 0·5. The claw, therefore, varies but little. In my specimen the terminal portion of the shaft of the penultimate feather is *white*, whereas in *C. richardi* it is black to the tip. In one of Mr. Brooks's skins it is the same, but in all four the amount of white on the webs of this feather is somewhat less than in mine. Mr. Ball states that in the Satpura hills specimens have very faint or no spotting on the breast.

Distribution.—This species, which, like Richard's Pipit, is migratory to Ceylon, arrives in October, and, according to some writers, is widely distributed. I have no doubt that it is so; but it cannot be so numerous as Richard's Pipit, which is probably taken for it by those who are not well acquainted with its distinguishing characters. Kelaart speaks of it as being common at Nuwara Elliya; but here he is evidently speaking of the Common Titlark, which, on the hills, is a more robust bird than in the low country. Mr. Holdsworth says it is not uncommon at Colombo in the north-east monsoon. I was unfortunate in not procuring it at the Galle face; many large Pipits which were shot by me on the Galle face during successive seasons all proved to be the

larger long-clawed species. My specimen was obtained in the flooded pasture-lands near the Virgel. I was struck by the peculiar appearance of the head and bill of certain Pipits I met with during a forced march to Trincomalie, and shot one (the only individual I had time to get), which proved to be the desired species. I have no doubt it is commoner on the extensive pastures and grassy plains in the great delta of the Mahawelliganga than anywhere else in Ceylon.

Concerning its distribution in India, Jerdon says, "Hodgson sent it from Nepal; Blyth first procured it from Darjiling, where I found it tolerably common about the station and in stubble-fields. I also procured it in the Nellore district, in the south of India, generally near low bushy hills, not approaching houses like the last (*C. rufula*); it is not rare at Saugor, in Central India, in similar localities. . . . . It does not breed, that I am aware of, in India, even at Darjiling, coming in towards the end of September." It is possible that the species noted from Kangra, North-west Himalayas, as *C. rufula* by Herr von Pelzeln may have been the present. It is recorded from the Deccan by the Rev. Dr. Fairbank, and Mr. Ball notes it from the Rajmehal hills, Bardwan, Singhbhum, Nowargah, and Karial. He likewise obtained it in the Satpura hills and in all the districts of Chota Nagpur. Mr. Brooks met with it at Assensole, and says that it is more abundant in that part of Bengal than the "Marsh-Pipit." I do not find any record of its occurrence on the eastern side of the bay north of Tenasserim, to the southernmost district of which province Mr. Hume says it is a rare visitant: it was there procured at Mergui and Bankasoon. The Marquis of Tweeddale identified this species in Capt. Wardlaw Ramsay's collection from the South Andamans; but Mr. Davison does not appear to have met with it there. Where it retires to during the breeding-season is still a mystery; but its haunts must be beyond the snowy ranges, if it does not nest anywhere in India.

Habits.—This fine Titlark frequents pasture-lands and plains covered with short herbage, moist fields, and, according to Indian writers, stubble-land. Mr. Davison found it in turfy and rice-land, and Mr. Brooks met with it in vetches and paddy-fields in Bengal. It appeared to me to be solitary in its habits, and it ran quickly about, stopping suddenly and holding itself very erect. Jerdon remarks that it has a stronger flight than the Common Titlark, and takes shelter under trees and shrubs. Mr. Brooks says that it rises with a loud discordant note, very different from that of any other Titlark; and by this it may be readily distinguished from Richard's Pipit, which it so much resembles at a distance. It feeds on worms and insects, which it takes from the ground or from the cattle-ordure on the pastures which it frequents.

PASSERES.

Series C. Sturnoid Passeres.

Wing with 10 primaries, the first of which is rudimentary. (Wallace, Ibis, 1874, p. 412.)

Fam. ALAUDIDÆ.

Bill variable, more or less conical and slender in some, stout and slightly curved in others; tip entire. Wings pointed, with the 1st quill normally present, but absent in one or two recognized genera of the family*; the tertials elongated. Legs more or less slender. The tarsus *scutate both before and behind*; claws straight; the hind claw generally elongated. Head in most crested.

Genus ALAUDA.

Bill rather conical, but slender, the culmen slightly curved. Nostrils *concealed* by a tuft of hair-like feathers. Wings moderate, pointed; the 1st quill minute, less than the primary-coverts; the 2nd, 3rd, and 4th quills subequal, the 3rd usually the longest. Tail moderately long, emarginate at the tip, the centre feathers shorter than the lateral ones. Tarsus moderate, equal to the middle toe and its claw, covered in front and behind with broad transverse scales, those behind being smoother than those in front; inner anterior claw longer than the outer; hind claw very long and straight.

ALAUDA GULGULA.

(THE INDIAN SKY-LARK.)

Alauda gulgula, Franklin, P. Z. S. 1831, p. 119; Jerdon, Cat. B. South India, Madr. Journ. 1840, xi. p. 30; Blyth, Cat. B. Mus. A. S. B. p. 132 (1849); Kelaart, Prodromus, Cat. p. 126 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 259; Jerdon, B. of Ind. ii. p. 434 (1863); Brooks, Ibis, 1869, p. 60; Holdsw. P. Z. S. 1872, p. 465; Hume, Str. Feath. 1873, p. 487, note; id. Lahore to Yarkand, p. 269, pl. 29 (1873); id. Nests

* The variation in the wing in this family is very remarkable, and precludes the satisfactory classification of the Larks as a group according to a given wing-formula. They appear to me, notwithstanding, to be better located in this series next the Pipits (the last family of the preceding group), than actually with them, because the 1st quill is normally present as an abortive or rudimentary feather, and the wing is consequently of *Sturnoid* formation. In the character of their plumage, as a rule, and in the structure of the foot, the Larks are allied to the Pipits through the genus *Corydalla*; and some genera, such as *Otocoris* (the horned Larks), might perhaps be placed in the latter family. The peculiar structure of the tarsus, in having scales behind as well as before, is, however, common to *Otocoris*, as well as to other genera; but the scales are scarcely perceptible with the naked eye. Were it not for its conical bill and short tertials, *Otocoris* would have quite the aspect of a Pipit, and may, I think, be considered as a connecting link between the Motacillidæ and the Alaudidæ.

and Eggs, ii. p. 486 (1874); Legge, Ibis, 1874, p. 25, et 1875, p. 399; Oates, Str. Feath. 1875, p. 342; Hume & Butler, ibid. 1876, p. 2; Armstrong, *t. c.* p. 337; Davison & Hume, B. of Tenass., Str. Feath. 1878, p. 409; Davidson & Wender, ibid. vii. p. 86; Ball, *t. c.* p. 223.

Alauda leiopus v. *orientalis*, Hodgs. Gray's Zool. Miscell. 1844, p. 84.

Alauda malabarica (Scop.), Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 467 (1856, in pt.); Hume, Str. Feath. 1873, p. 41.

Alauda australis, Brooks, Str. Feath. 1873, p. 486.

The Common Indian Lark, Horsf. & Moore. *Buruta pitta*, Telugu, also *Niala pichike*, lit. "Ground-Sparrow;" *Manam badi*, lit. "Sky-bird," Tamil; *Bhurut*, Hind. (Jerdon); *Pullu*, lit. "Wormpicker," Ceylonese Tamils.

Gomarita, Sinhalese.

Adult male. Length 6·2 to 6·3 inches; wing 3·35 to 3·7; tail 2·0 to 2·15; tarsus 0·95 to 1·0; middle toe and claw 0·85 to 0·95; hind toe 0·45, claw 0·55 to 0·7; bill to gape 0·68 to 0·72.

Individuals vary much *inter se* both as to wing and robustness of bill even when shot in the same locality.

Adult female. Length 6·0 inches; wing 3·1 to 3·5.

Iris hazel-brown or chocolate-brown; bill, upper mandible brown, paling towards the margin, lower mandible fleshy, tip dusky; legs and feet brownish fleshy, toes dusky towards the tip, claws brown.

Above rich sepia-brown, the feathers broadly edged on the hind neck, back, scapulars, and rump with fulvescent yellowish, passing with a rusty hue into the brown next the shaft, and more narrowly margined with the same on the head; the margins of the feathers on the back generally pale to whitish at the tips, and on the hind neck they are broader than elsewhere; wing-coverts broadly edged with rufescent grey, and the secondaries and inner primaries deeply with brownish rufous, the margins of the outer primaries being narrower, and the outer web of the 1st long quill wholly pale; tail with the lateral rectrice whitish buff, except at the base of the inner web, and the next with the outer web and tip the same; lores dusky, surmounted by a whitish supercilium; beneath the eye and on the ear-coverts the feathers are edged and tipped with brown, and the lower part of cheeks more or less spotted with the same; chin, throat, and under surface fulvescent white, the lower part of fore neck and chest sepia-brown, centres and the basal portion of the upper breast-feathers rufescent; lower flanks striated with brown.

Examples vary in the depth of rufous coloration. Jaffna specimens are palest.

Young. Birds of the year have the feathers of the upper surface rounded at the tips, especially on the head, where the tips are whitish; the back-feathers are likewise tipped with white, and have one web mostly rufous, the other being margined with the same; greater wing-coverts boldly margined with rufous-buff; tertials tipped and edged with fulvescent rufous; the rufous margins of the quills very bright; supercilium and under surface more rufescent than in the adult.

Immature birds are at once recognizable by the white-tipped rounded upper-surface feathers, and by their more rufous coloration.

Obs. The Ceylonese Sky-Lark belongs to the rufous type of *Alauda gulgula*, the typical form of which was described from the North-west Provinces by Franklin. Typical examples of this bird from the northern parts of India are much paler than those from the south of the peninsula and from Ceylon; but the species has been found (by accumulating a large series from all parts of India) to divide itself into so many local races, running, as Mr. Hume says, into one another in such a manner, that it is not possible to consider them worthy of specific rank.

The Nilghiri race (*A. australis*, Brooks) appears, from this gentleman's description, to be a larger and more rufous bird than ours. He gives the wing-measurement as 3·84, and the upper surface would appear to correspond in tint with that of a yearling *A. gulgula* from Ceylon. A North-Indian example in the British Museum from Behar is quite as rufous as any Ceylon skin in my collection; it measures—wing 3·6 inches, tarsus 0·8, bill to gape 0·68. Another from Mogul Serai (wing 3·6) is not very much paler than specimens I have shot at Jaffna, although the margins of the back and wing-feathers are not so rufous. One or two Futtehgur specimens collected by

Mr. A. Anderson are paler above and beneath than my birds, and the hind claws are longer than in most Ceylonese specimens. I notice particularly the absence of rufous tinting on the breast-feathers. The wings in two skins measure 3·6 and 3·7.

Messrs. Sharpe and Dresser, in their article on the European Sky-Lark (*A. arvensis*), look upon the Indian form as a diminutive of that bird, having the tail-feathers more pointed and the outer pair more tinged with isabelline rufous. In addition to this it must be noted that *A. arvensis* is not so rufous on the under wing, and the 4th primary is considerably shorter than the 3rd, whereas in the Indian bird it is only slightly so.

Distribution.—The Indian Sky-Lark is a resident in the northern half, east, and south-east of the island, as well as in the eastern parts of the Kandyan Province, and a north-east monsoon visitant to the western and south-western portion of the country between Colombo and Hambantota. It is found throughout the year as far down the west coast as Chilaw; and from that district to the Jaffna peninsula it is very common, inhabiting the islands of Karativoe, Manaar, and all those in Palk's Straits. As regards the east of the island, it is most numerous round the south-east coast. At Colombo it makes its appearance after the rains in October, and does not quit the district until May, on the 5th of which month I have even seen it at Galle. It is not unfrequent on most of the patnas of Uva throughout the year, the highest point at which I have seen it being Carey's Gap, 5200 feet.

On the mainland this Lark is diffused throughout India from the extreme south to the Himalayas, extending on the one side westwards into Sindh and on the other into the countries eastward of the Bay of Bengal as far south as Moulmein, being confined to the neighbourhood of that town and the tract between the Sittang and Salween rivers. In the south it is found abundantly on the Nilghiris, and from Ootacamund came the type of Mr. Brooks's *A. australis*. Miss Cockburn found it breeding on this range of hills, and Mr. Wait likewise at Conoor. It has not been recorded from the Travancore hills or from the Palanis by either of the oft-quoted writers in 'Stray Feathers;' but it may possibly occur in them, particularly on the grassy slopes of the latter. It is not mentioned either from the Deccan by Dr. Fairbank; but Messrs. Davidson and Wender say that it is not uncommon in Satara. In the Mount-Aboo district Captain Butler says it is not very plentiful, and he does not note it from the mount itself. It occurs in all the surrounding region, though it is not common in Sindh. It was procured in that province by Messrs. James and Blanford. It extends from this section of country up into Cashmere and along the Himalayas, in many of the tracts at the foot of which mountains, such as Kumaon, it is common. In the North-west Provinces and in Bengal it is as much at home as anywhere else in India; but in Chota Nagpur does not seem to be well distributed, as I find that Mr. Brooks only procured it at Assensole. Mr. Ball notes it in his list of birds from the Godaveri and Ganges region, from Bardwan, Sirguja, Jashpur, Udaipur, and Bilaspur. Eastwards Dr. Armstrong found it evenly distributed in the Irrawaddy delta; and in Burmah Mr. Oates notes it as a visitant; further south it extends, as above remarked, as far as Moulmein.

Habits.—This songster frequents the same situations as its European congener—pasture-land, stubble-fields, bare commons, and so forth. It is, however, with us particularly noticeable on the rich pastures surrounding the great inland tanks of the northern half of the island. No meadows in old England in the merry month of May sound more pleasantly with the sweet song of Larks than do these lovely spots in Ceylon, surrounding the lasting monuments of the might of its ancient kings! These verdant lands remind the sojourner in tropical Ceylon of home; the long meadow-like grass, the browsing hundreds of cattle driven down by the Kandyans to fatten, and the air filled with the song of the Sky-Lark recall pleasant memories; but let the wanderer awake from his reverie and only cast his eye around on the boundless circle of dark forest, and the broad, wooded lake, its surface broken here by the head of a stealthy crocodile and there by the stately form of a huge Pelican slowly floating along its glassy waters, and the vision of green English meadows is quickly dispelled. A more peaceful existence obtains for the Sky-Lark in Ceylon than in India; in the latter country, when "flocked" in the cold season, it is caught in great numbers for the table, and is sold in Calcutta, in common with various Pipits, as "Ortolan." Its home in Ceylon, however, is in the woods and plains far away from the epicurean wants of large towns; and were it ever found in abundance near Colombo, the Buddhists of Ceylon are so averse to bird killing, that I do not think the Lark would have many enemies to fear.

Its European relative fares worse still, for it is captured, as nearly every one knows, in fabulous numbers for the table (we read, in Professor Newton's edition of Yarrell, of 1,255,500 having been taken into the town of Dieppe during the winter of 1867–8); but in addition to this danger it is forced to migrate in vast flocks to southern districts when deprived, by a heavy snowstorm, of its sustenance, great numbers never again returning; and it is therefore a wonder that this species remains so numerous as it is.

But to return to the habits of our bird. It sings, I think, quite as sweetly as the European Lark, but not so loudly, and its song is not so long sustained, neither does it mount so high in the air. At times this Lark maintains its position on the wing by a continued fluttering of its pinions; but it may be more often seen making several powerful strokes and then suddenly closing its wings, which movement causes it to dip in the air, from which it rises again by the same vigorous strokes, continuing this alternate rising and falling until it descends to earth.

The flesh of the Indian Sky-Lark is excellent eating. It feeds on small insects and various kinds of grass-seeds, and during the cool season congregates in flocks, which lie close in the long grass and get up in the same manner as the European species, flying off with a low straight flight and suddenly dropping again to earth.

Mr. Brooks styles it a most delightful songster and quite equal to the Sky-Lark, with even a sweeter song. Jerdon noticed that it frequented, as a favourite resort, the grassy sides of tanks and also the bunds of rice-fields, on which, he says, it often breeds. In the islands off the Jaffna peninsula I have observed it in long grass among bushes, the usual haunt of the Bush-Lark.

Nidification.—The breeding-season of this Lark in Ceylon is from May until July or August. The nest is placed in a depression in the ground and sheltered generally by a tuft of grass; sometimes a rut protected by a corresponding inequality in the surface is chosen, and at others the hollow would seem to have been partly prepared by the bird herself. The nest is rather neatly made of fine grass and roots of the same, lined sometimes with a little cattle-hair; the egg-cavity is a broad cup in shape, about 3 inches in diameter and $2\frac{1}{2}$ in depth. The eggs are three or four in number, of a whitish or greyish-white ground-colour, spotted or freckled all over with light-brown or greyish-brown ill-defined markings. The brown is of various shades, and the character of the markings varies somewhat, some eggs being more closely freckled than others.

Much information concerning its nesting is given in Mr. Hume's work, Miss Cockburn, as usual, supplying many interesting details. She is of opinion that the birds scratch the hole for themselves, and says:—"I have noticed a bare, smooth, round hole from which a pair of Larks had flown away, and some days after as neat a Lark's nest as possible occupied the same spot. The material they use is entirely fine grass twisted round and round the hole nearly half an inch thick; this fine grass is also placed a little over the edge on the side at which they enter . . . Sky-Larks never lay twice in the same nest, but always build a new one for every brood."

As to the eggs of the Indian bird, Mr. Hume says that all the different races lay precisely similar eggs, those he has received from the Nilghiris, Central Provinces, Sharunpoor, Almorah, and Cashmere being undistinguishable. They are of two types—the one a cream-coloured ground, freckled *finely* with small spots of purplish grey and brownish yellow; the other a nearly pure white ground, with larger and less densely set markings of the same hue. The average size is 0·8 by 0·61 inch.

[N.B.—A further species will be treated of in an extra article in the Appendix.]

Genus MIRAFRA*.

Bill stout and curved, deep at the base; the culmen keeled. Nostrils elongated and *exposed*. Wings moderate, rounded; the 1st quill *unusually long*, the 2nd shorter than the 3rd, which is the longest, 4th and 5th longer than the 2nd. Tail short, emarginate, the lateral feathers longer than the central pair. Tarsus long, covered in front with transverse scales and behind with obsolete plates; middle toe and claw shorter than the tarsus; hind claw long and curved.

MIRAFRA AFFINIS.

(THE MADRAS BUSH-LARK.)

Mirafra affinis, Jerdon, Cat. B. S. India, Madr. Journ. xiii. pt. 2, p. 136 (1844); id. Ill. Ind. Orn. pl. 38 (1847); Blyth, Cat. B. Mus. A. S. B. p. 133 (1849); Layard & Kelaart, Cat. Ceylon B. Prodromus, App. p. 59 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 259; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 475 (1856); Jerdon, B. of Ind. ii. p. 417 (1863); Holdsw. P. Z. S. 1872, p. 465; Ball, Str. Feath. 1874, p. 422; Hume, Nests and Eggs, ii. p. 474 (1874); Legge, Ibis, 1875, p. 399; Fairbank, Str. Feath. 1877, p. 408; Ball, ibid. 1878, vii. p. 223.

The Lark, Europeans in Ceylon. *Eeli-jitta*, Telugu; *Leepee*, in Central India; *Chirchira*, Hind. (Jerdon).

Gomarita, Sinhalese.

Adult male and female. Length 5·8 to 6·4 inches; wing 3·0 to 3·35; tail 1·6; tarsus 1·0 to 1·15; middle toe and claw 0·9 to 1·0; hind toe 0·4, claw 0·6. Females average smaller than males.

Iris varying from reddish to yellowish brown; eyelid brownish fleshy; bill, upper mandible dark brown, margin and the lower mandible, with the exception of the dusky tip, fleshy; gape fleshy; legs and feet fleshy, edges of scales brownish.

Above sepia-brown, margined on the head with fulvous-buff, on the back and rump with fulvescent greyish, and on the hind neck and wing-coverts with buff-white, imparting a whitish appearance to the former part: quills and tail sepia-brown; secondaries and all but the outer primaries, which have pale edges, margined with rufous, and with the margin and the basal portion of the inner webs the same: outer and most of the inner web of the lateral rectrice buff, and the margins of the next two the same; supercilium buff; lores dusky; ear-coverts and cheeks tipped with brown: beneath fulvous-white, the feathers of the lower part of the throat and chest with broad sepia-brown centres; flanks shaded with rufescent; under wing-coverts shining pale rufous.

Young. In nest-plumage the bill is paler than in the adult, the under mandible being mostly fleshy. The feathers of the head and back rounded at the tips, and the margins rufous on the head and buff on the back; tertials with bright but narrow margins, and not blending into the brown, as in the adult: upper tail-coverts margined with rufous; beneath whiter than in the adult; the chest with numerous dark "drops," and the feathers on the centre of the throat tipped with blackish; thighs rufescent; outer tail-feathers with conspicuous rufous margins, the inner web entirely brown, which colour gradually decreases with age.

Obs. Four examples in my possession from the Madras Presidency measure from 3·1 to 3·3 inches in the wing; they

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* The Bush-Larks in the possession of an abnormally long 1st primary seem to have affinities with some of the round-winged *Turdoid* series, and are just as awkward members of this puzzling family to deal with as the nine-primary Crested and Sand-Larks, which appear to grade towards the Pipits.

vary, as is the case in Ceylon, in size of bill; the tints of the under surface correspond with those of our birds, and the striations on the chest are similar; they are somewhat darker on the back; the amount and distribution of the rufous on the primaries and secondaries are the same. The tarsus averages shorter* in these examples, ranging from 0·9 to 1·0 inch. A Travancore specimen has the bill very robust, and is more richly coloured than most Ceylon birds. In the India Museum is a skin from the Deccan, which has the wing 3·0 inches and the tarsus 1·05; it is somewhat slender in the bill, but not more so than females from Ceylon.

M. erythroptera, Jerdon, is closely allied to the present species, differing, as its name denotes, in the redder wing. The primaries and the secondaries, except the first of the former and the innermost of the latter (exclusive of the "tertials"), are rufous right across both webs to near the tips; the primary-coverts are rufous, and the greater secondary-coverts rufous on the outer webs and brown near the shafts. A specimen in the national collection measures—wing 3·0, tail 2·0 inches.

Mr. Hume has described the Burmese Bush-Lark under the name of *M. microptera*. It is smaller than *M. affinis*, measuring 2·6 to 2·8 inches in the wing, and it has no rufous on the outer webs of the primaries.

M. assamica and *M. cantillans* are two other Indian Bush-Larks. The former, the Bengal Bush-Lark, differs from its congeners in the grey plumage and very thick bill; the latter, the Singing Bush-Lark, is distinguished, says Jerdon, from other species by its slender bill and less amount of rufous on the wing; a specimen before me (in the national collection) has the wing 2·9 inches.

Distribution.—This interesting bird is widely distributed throughout the low country of Ceylon, the only part of the low-lying districts in which it is not numerous being the damp south-western coast-region between Kalatura and Matara. In the east and throughout the whole northern half of the island it is very common, both in the interior and on the sea-board. In the North-west Province and in the drier parts of the Western Province it is likewise numerous, being one of the commonest birds to be seen even in the cinnamon-gardens of Colombo and Morotuwa; thence round to Tangalla, beyond which it is again abundant, it is found in less numbers, and is chiefly confined, and that sparingly, to the sea-coast. Throughout the flat jungles between Haputale and the sea it is tolerably common. I am not aware that it is found in the Kandyan districts; but it may perhaps occur, as a rare straggler, in the lower parts of Dumbara. It is found near the base of the hills in the Kurunegala neighbourhood.

On the mainland, this Bush-Lark is chiefly confined to the southern portion of the peninsula. Jerdon remarks that it is "found on the Malabar coast, in the Carnatic, in Mysore, and the southern part of the table-land, extending north to Goomsoor and Midnapore. Col. Tytler states that it occurs at Barrackpore, but it is certainly very rare in Bengal." Mr. Ball asserts it to be tolerably abundant in Singhbhum, and records it from Midnapur, Manbhum, and Gumsur. It seems therefore to stretch from the Carnatic northwards in an easterly direction, avoiding all divergence towards Central India. I notice that the Rev. Dr. Fairbank does not record it from the Deccan, nor do Messrs. Davidson and Wender, although *M. erythroptera* is noticed by these gentlemen as very common there. It is abundant about Madras, and also inhabits Ramisserum Island and the adjacent coast. Dr. Fairbank found it at the base of the Palanis.

Habits.—This Lark loves grassy wastes, studded with trees and bushes, openly timbered plains, scrubby

* Since this article was printed, I have received a letter from Mr. Hume containing a remark on this species, which, according to ornithological custom, I quote here:—"Have I ever pointed out to you that your *Mirafra*, which I call *M. ceylonensis*, is distinct from the Madras bird, *M. affinis*? It is a much larger, richer-coloured, longer-billed bird, with markedly larger legs and feet. I have just compared five examples from Colombo with a large series of Madras specimens." Now this bird varies in Ceylon. The five examples alluded to are all from Colombo; and as regards size see my comparisons above. I do not find that South-Indian specimens are more richly coloured; one from Travancore, which I obtained from Mr. Whitely, Woolwich, differs considerably in brightness of coloration from St. Thomas's Mount examples. Brightness of coloration in the Lark family is often dependent on age. The tarsus in Ceylonese birds *is*, as a rule, longer, as I have above noticed, but short-legged insular birds equal long-legged continental ones. A male from St. Thomas's Mount (wing 3·21) measures, tarsus 1·05; a good-sized female (wing 3·15) from Trincomalie measures, tarsus 1·05.

If, on the whole, it be hereafter decided by general consent that the Ceylon species should stand distinct, it must be as a very close subspecies indeed; but I would here remark that, above all birds, Larks are the most unsafe to tamper with. If we once begin to divide them up, there will be no end to subspecies.

enclosures, and dry pasture-land surrounded by trees. It is also found in open spots in the heart of the jungle and round the borders of tanks and salt-water estuaries and lagoons. It is to some extent arboreal, especially in the breeding-season, when the male constantly mounts to the topmost branch of some dead or scraggy tree, and pours out his little love-song, launching himself out into the air, and descending rapidly, with increasing fervour of note, to the vicinity of the nest, where his partner is patiently performing the duties of incubation. It is not gregarious, but usually lives in pairs, several of which, however, occupy contentedly the same locality, passing their time in catching insects, and feeding likewise on grass-seeds, varying the monotony of the noonday heat by now and then flying up into the air, or alighting on trees and bushes, from which they give out their long-drawn sibilant whistle, *tseee-tseee-tseee*. These Larks do not mount to any height, nor do they remain any time in the air; their actions are Pipit-like, for after reaching the altitude to which they wish to ascend, they quickly sail down again with upturned wings, continuing the note they commenced with on leaving the ground until they realight, when it is suddenly hushed. They often descend to a low tree or bush, and sometimes continue their notes for a few seconds. Mr. Ball remarks that it is a very early bird, sometimes singing before dawn.

Nidification.—In the Western Province, the Bush-Lark breeds in May and June, and in the north somewhat earlier, commencing about March. It nests in a little depression in the ground, generally beneath the shelter of a tuft of grass or tussock of rushes. It sometimes, however, in sandy soil excavates a hollow itself, and therein it constructs its nest. It is a loosely-made cup of dry grass and fine roots of herbs, measuring about three inches wide by two in depth; the top is flush with the surface of the soil, and over the nest the adjacent blades of grass are bent, or arranged so as to conceal it. The eggs are nearly always two in number, stumpy ovals in shape, and of a greenish-white ground-colour, boldly marked almost equally throughout with light umber-brown and blackish-brown spots, the latter being small in some and large in other eggs.

The young become fledged very rapidly, flying in about a fortnight from the time they are hatched. The old birds are very zealous in their attempts to draw off intruders from their young, running along the ground with trailing wings, or feigning lameness or incapacity to fly!

Genus PYRRHULAUDA.

Bill short, stout, conical, the culmen much curved; gape angulated; margin of under mandible slightly concave. Nostrils basal, round, and concealed by tufts. Wings long, the tertials elongated; 1st quill equal to the primary-coverts, the 2nd and 3rd equal and longest. Tail moderate, emarginate at the tip. Tarsus short, covered in front and behind with broad but smooth scales. Feet small, with the lateral toes equal and the claws straight; the hind claw stout and considerably longer than the anterior ones.

N.B.—The hindermost tarsal scales are very plainly developed in this genus.

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PYRRHULAUDA GRISEA.

(THE BLACK-BELLIED FINCH-LARK.)

Alauda grisea, Scopoli, Faunæ Insubr. ii. p. 95 (1786).

Alauda gingica, Gmelin, Syst. Nat. i. p. 795 (1788).

Fringilla crucigera, Temm. Pl. Col. 269. fig. 1 (1838).

Pyrrhulauda crucigera (Temm.), Jerdon, Cat. B. S. India, Madr. Journ. xi. p. 35 (1840).

Pyrrhulauda grisea, G. R. Gray, Gen. B. ii. p. 381 (1841); Blyth, Cat. B. Mus. A. S. B. p. 134 (1849); Kelaart, Prodromus, Cat. p. 126 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 259; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 479 (1856); Jerdon, B. of Ind. i. p. 424 (1863); Holdsw. P. Z. S. 1872, p. 465; Hume, Str. Feath. 1873, p. 212; Adam, *t. c.* p. 388; Hume, Nests and Eggs, ii. p. 478 (1874); Ball, Str. Feath. 1874, p. 422; Legge, ibid. 1875, p. 371; id. Ibis, 1875, p. 399; Butler & Hume, Str. Feath. 1875, p. 499; Fairbank, ibid. 1876, p. 261; Hume, *t. c.* p. 459; Fairbank, ibid. 1877, p. 409; Ball, ibid. 1878, vii. p. 223; Cripps, *t. c.* p. 295.

Alouette grise de Gingi, Scopoli, Sonn. Voy. Ind. ii. p. 203 (1782).

Gingi Lark, *Duree Finch* (Latham); *Squat Finch*, *Ortolan*, Europeans in India. *Diyora*, *Duri*, and (most commonly) *Dabhak-churi*, lit. "Squat Sparrow," Hind.; *Chat Bharai*, *Dhula-chata*, in Bengal; *Poti-pichike*, lit. "Short or Ground-Sparrow."

Adult male. Length 4·8 to 5·0 inches; wing 3·0 to 3·1; tail 1·6; tarsus 0·6; middle toe and claw 0·55; bill to gape 0·5.

Iris brown or yellowish brown; bill whitish; legs and feet reddish grey, claws dusky; eyelids brown.

Above greyish brown, with a rufescent tinge on the back, the bases of the feathers brown, and the head paling gradually into the albescent of the forehead: wings and tail brown, the coverts, tertials, and secondaries very broadly edged and tipped with whitish: the major coverts and tertials slightly tinged with rufous: tail pale edged, with the outer feathers almost entirely rufescent whitish; cheeks and ear-coverts white; a broad band from the gape over the eyes to the occiput, chin, throat, sides of fore-neck, centre of chest, breast, belly, and under tail-coverts dull black; under wing-coverts the same; sides of chest greyish white.

In abraded plumage the *fulvous-brown margins of the clothing-feathers disappear and the "ribs" of the webs become bleached, giving the plumage a grey appearance*; the pale tips of the tertial feathers and the margins of the rectrices likewise disappear.

Female. Length 5·8 inches: wing 2·75 to 2·95.

Bill not so white as in the male.

Head and upper surface earthy brown; the upper tail-coverts margined with whitish: the wings not so conspicuously margined; the white cheeks and all the black markings are wanting, the under surface being albescent, washed with fulvous-brown on the chest, the feathers being centred darker than the edges; flanks dusky; bases of the greater under wing-coverts dark brown; supercilium and space just beneath the eye buffy white: ear-coverts brownish. In birds in old plumage the upper tail-coverts are dark from abrasion.

Young. The nestling is at first covered with fulvous-coloured down.

A *young female* (St. Thomas Mount, Madras) has the feathers of the head and occiput tipped with ochraceous and marked with a subterminal blackish band; the feathers of the back and rump have the same blackish markings, but not so dark, and their tips and lateral margins are buff; ear-coverts and sides of neck brownish tawny: wing-coverts and tertials broadly margined with fulvous tawny; upper tail-coverts pale fulvous; central tail-feathers sandy buff, and the whole edged with buffy white: beneath tawny yellowish; the chest and breast with dark centres to the feathers.

The tarsal scales are very pronounced in this immature specimen.

Males of the year are no doubt browner on the upper surface than adults, and the forehead is not albescent; but the peculiarly grey appearance of the latter arises from abrasion. The moulting-time is in March and April.

Obs. Examples kindly sent me by the Director of the Madras Museum from the neighbourhood of that place are very similar to our birds. A male in abraded plumage is not quite so grey as some of my specimens, and the black superciliary streak is broader. A female is slightly darker. ♂, wing 2·95 inches; ♀, wing 3·0. Another male measures 3·1 in the wing.

A female in Mr. Anderson's collection from Futtehgur is paler above than any Ceylonese examples; the edges of the feathers are grey, and the centres not so brown; wing 3·0 inches. Two examples from "Bengal" in the national collection, male and female, measure 3·0 and 2·8 inches in the wing respectively; the latter is very dark and the former of a decidedly pale type. Specimens from Northern India, and especially from Sindh, are probably, as a rule, paler than Southern birds.

Allied to the present species is *P. melanauchen*, Cabanis, = *P. affinis*, Blyth, from Sindh, &c., the males of which have the crown and occiput black or concolorous with the eye-streak, and a broad white forehead. In the type mention is made of a blackish spot on the nape; but it does not, according to Mr. Hume's remarks (Str. Feath. 1873, p. 212), always appear to be present. This species is larger in the bill and wing than *P. grisea*.

Distribution.—This curiously plumaged and pretty little Lark was believed by Layard to be migratory; this is, however, not the case, although from his remark, "I have seen flocks careering from the direction of the continent when out dredging," there seems to be a movement of the species from the continent to the north of the island, probably during the cool season. It is a resident in all the dry and arid portions of the maritime provinces of Ceylon, scarcely ever, to my knowledge, except as a straggler, extending more than about twenty miles inland. In the north of the island, and in all the islands between Jaffna and Manaar, down the west coast as far as the Chilaw district, and entirely round the east side to the borders of the wet region on the Girawa Pattu, it is a common bird; but south of Negombo and round the south-west coast to Tangalla it is not found. On one occasion as I was riding up the Pass from Rambodde to Nuwara Elliya, in November 1870, when near the top I was astonished to see feeding quietly by the roadside a male Finch-Lark. This, I believe, is the only instance of its being seen at any great elevation, and the only occasion which I know of its being found in the interior of Ceylon; and its occurrence at that great altitude is so remarkable that I am unable to come to any other conclusion than that it was driven south by the high north-east winds and stormy weather which were at that time prevailing. Were there dry plains in the interior of Ceylon, it would, of course, be found on them.

This Finch-Lark is found all over the plains of India, from the extreme south to the foot of the Himalayas, except, says Jerdon, on the Malabar coast. It is particularly abundant, according to the same author, in Western India, Sindh, and the Punjaub; and in the North-west Provinces Mr. A. Anderson recorded it as common. It is found in Ramisserum Island and on the adjoining mainland. About Madras it is common; and the Rev. Dr. Fairbank procured it at Peria Kulam near the base of the Palanis, and which place has an altitude of more than 900 feet. In the Deccan it is, according to the same observer, very abundant. Mr. Ball found it very common in all the open parts of the Chota Nagpur, and he records it from many places and districts between the Godaveri and the Ganges, including the Rajmehal hills. In Furreedpore it is "pretty common;" but Mr. Cripps has not observed it there between the months of November and February. It does not extend into the countries to the eastward of the Bay of Bengal, but has, on the contrary, a westerly range. On the plains of Sindh, Kattiawar, Guzerat, and in the Sambhur district it is found in abundance. Captain Butler obtained it close to Kurrachee, but did not observe it on Mount Aboo. Its extending into Arabia, as mentioned by Jerdon, doubtless refers to the allied species *P. melanauchen*, which has a western distribution.

Habits.—This sociable little Lark is fond of the barest plains and the driest ground that it can find. It especially frequents, therefore, the arid land surrounding the great salt-water lagoons and "leeways" and the wide estuaries and river-mouths which indent the whole of the north and east coasts of the island. I have often seen it on the dried-up fore-shores of the Hambantota "leeways," or the vast sand tracts which are left bare in the dry season at the head of the Jaffna and other lakes in the north, sitting motionless in those

dreary wastes without another living creature near save a few Stints or Shore-Plovers, which were running along the edge of the tepid water, having nothing in common with the lonely little "Squat Sparrow." It is also generally found on the uncultivated paddy-fields (converted by want of irrigation and a burning sun into the barest possible pasture) which are so marked a feature of the poverty-stricken districts of the north and south-east; here it displays a sociable nature, feeding in closely associated little troops, and tripping along the ground like a party of Munias. It is excessively tame, and, as Jerdon truly remarks, squats stupidly on the ground, and will almost allow itself to be ridden over. From its squatting habits it has obtained its numerous native Indian sobriquets. Its ordinary note is a cheerful little chirrup; but it has a sweet song which it warbles out when rising in the air, like a true Lark, though it does not mount so high, nor does it remain poised on expanded wing more than a minute or two. It has a habit of suddenly rising off the ground and quickly dropping again; but when moving about it is capable of considerable powers of flight. True to the nature of its family, it is one of the first birds abroad in the morning; but it is also one of the last to go to roost at night, the song of the male being often heard *after* the short tropical twilight has sunk into the shades of night. It feeds on small grass-seeds; but I have often found insects in its stomach, and have seen it dart up and catch a passing fly. The males congregate together out of the breeding-season, and seem to leave their quondam mates to their own devices.

Jerdon writes concerning it:—"It is remarkable for the sudden ascents and descents of its flight, mounting up some height by a few flappings of its wings and then descending almost perpendicularly till it nearly reaches the ground, when it again rises as before, and repeats this several times. In general it takes but a short flight, and on alighting squats close to the ground, and will allow itself to be ridden over before it rises. It occasionally may be seen seated on the housetop; but I never saw it perch on a tree, except on one occasion when I observed about twelve or fifteen of them perched on a low tree close to Cantonment in the hot weather."

Sundevall speaks of it singing in the air with expanded wings, as I have noticed above; but I have nevertheless only seen it do this in the dusk of the evening and at daybreak.

Nidification.—The Finch-Lark breeds in the north and east of Ceylon from April until August, placing its nest in exposed places and bare spots away from all shelter. It sometimes scoops a hole in the ground for its domicile, while at others it chooses a small rut or natural hollow. I have found its nest on esplanades and public commons close to the paths frequented by hundreds of natives during the day. They are, as a rule, loosely put together, made of dry grass, roots, stalks, bits of rag or cotton, and without any particular lining; but some are more neatly constructed of fine grass like a Lark's. Round the edge of two or three nests, on the Trincomalie esplanade, were little circles of small pieces of brick and tile, which must have been carried some distance, as there were none close by. Were these efforts of instinct as regards protection, or were they the result of a desire for ornamentation? Two is the normal number of eggs: they vary somewhat in shape, some being stumpy ovals and others slightly pointed at the small end; the ground-colour is greenish white or whitish, freckled all over with minute spots of yellowish brown, olive-brown, and slaty grey, with some larger markings of the same, forming a zone at the obtuse end, or they are sparingly spotted with larger markings of yellowish brown and bluish grey over minute specks of brown. They measure from 0·71 to 0·8 inch in length, and from 0·52 to 0·55 in breadth.

Mr. Adam writes of a nest which he found built in the low retaining wall of a salt-pan in the Sambhur Lake being encircled by "a belt, about 5 inches broad, of small flakes of a saline incrustation about one-tenth of an inch in thickness; the pieces varied much in size, but the largest were about an inch long by half an inch broad." This nest was composed of coarse pieces of grass worked carelessly together, and here and there were pieces of cloth. Mr. Cripps remarks:—"I once found its nest in the dry bed of a river in front of my house; it was on the 26th April, 1878. The nest was a tiny cup-shaped affair of fine grass-roots, which were firmly held together by damp sand, so much so that on taking it up it appeared like a ball cut in two; it contained two fresh eggs. There was not even a small tuft of grass anywhere where the nest was, only some tamarisk-shoots above and shading it."

Mr. Anderson once found the nest in the centre of a lump of cowdung, all over which white ants had left their marks, so that detection was almost impossible. But singular as are the situations so frequently

chosen by this curious little bird to build in, the following instance related by Mr. Hume is the most extraordinary that has come under my notice. He writes ('Nests and Eggs'):—"I may note that at Etawah we found a nest of this species also amongst the ballast between the rails, so that here too" (in reference probably to the nest of another species) "the trains must have passed a dozen times a day and night over the sitting bird. When we think of the terrible heat glowing from the bottom of the engine and the perpetual dusting-out of hot cinders, it seems marvellous how the bird could have maintained her position."

I would suggest that in this case the bird allowed the heat of the sun to incubate the eggs by day, and that she only sat at night, and being asleep was not disturbed by the trains. The average of thirty eggs is 0·73 by 0·55 inch.

PASSERES.

Fam. PLOCEIDÆ.

Bill conic, as in Fringillidæ, but stouter; the culmen widened and flattened at the base, and the sides perpendicular; tip entire. Nostrils basal, small, round, and exposed. Wings with the 1st primary minute. Tail of 12 feathers, rather short, rounded or pointed in some. Legs and feet stouter than in the Fringillidæ; tarsus covered in front with broad scales.

Genus PLOCEUS.

Bill large; the culmen curved from the base and flattened, the sides tumid and overhanging the margin of the under mandible. Nostrils circular and basal, gonys straight. Wings moderate, the 1st quill exceeding the primary-coverts; the 3rd and 4th the longest, and the 2nd shorter than the 5th. Tail moderately short, rounded at the tip. Legs and feet stout; tarsus scaled, longer than the middle toe, outer toe slightly exceeding the inner; claws rather long; hallux stout.

PLOCEUS PHILIPPINUS.

(THE COMMON WEAVER-BIRD.)

Loxia philippina, Linn. Syst. Nat. i. p. 305. no. 36 (1760), *ex* Brisson.

Ploceus philippinus (L.), Sykes, P. Z. S. 1832, p. 105; Blyth, Cat. B. Mus. A. S. B. p. 115 (1849); Kelaart, Prodromus, Cat. p. 125 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 257; Walden, Trans. Zool. Soc. 1877, ix. p. 210; Hume, B. of Tenass., Str. Feath. 1878, p. 399; Ball, ibid. 1878, vii. p. 222.

Ploceus baya, Blyth, J. A. S. B. 1844, xiii. p. 945; Jerdon, B. of Ind. ii. p. 343 (1863); Holdsw. P. Z. S. 1872, p. 463; Adam, Str. Feath. 1873, p. 387; Legge, Proc. R. S. Tasmania, p. 30 (1873); Hume, Nests and Eggs, ii. p. 437 (1874); Ball, Str. Feath. 1874, p. 420; Hume & Butler, ibid. 1875, p. 495; Hume, ibid. 1877, p. 323; Davidson & Wender, ibid. 1878, vii. p. 85.

Le Toucnam-courvi, Buffon, Nat. Hist. Ois. iii. p. 465; *Baya*, Hind.; *Chindora*, Bengal.; *Bawi* or *Talbali*, Bengal.; *Parsupu-pitta*, Telugu; *Manja-kuruvi*, Tamil (Jerdon); *Pastro carpenteiro*, Portuguese in Ceylon; *Thuckenam kuruvi*, lit. "Basket-maker bird," Ceylonese Tamils.

Tatta kurulla and *Wada kurulla*, Sinhalese.

Adult male. Length 5·7 to 6·0 inches; wing 2·6 to 2·8; tail 1·8 to 2·0; tarsus 0·8; middle toe and claw 0·9 to 0·95; bill to gape 0·65 to 0·7.

Iris hazel-brown; bill blackish brown, lightish at gape and base of lower mandible; legs and feet dusky or reddish fleshy, claws brownish.

Breeding-plumage. Forehead, head above, chest, and sides of upper breast glistening saffron-yellow, blending into the brown of the nape and hind neck, the feathers of the interscapular region edged likewise with yellow; back, wings, and tail sepia-brown, paling on the upper tail-coverts, which are generally tipped with yellowish; the coverts, tertials, and most of the secondaries with broad fulvous-grey edgings; primaries and rectrices with pale margins; lores, orbits, face, ear-coverts, and throat blackish brown, paling on the chin, breast, and lower parts into whitish, with a pale brownish wash on the flanks and thighs; shafts of the flank-feathers dark.

In *nonbreeding-plumage* the iris is paler, the bill brownish above, fleshy at base beneath; the yellow parts are wanting, the head being brown as the neck, with a brownish-white supercilium; the ear-coverts and face brown, and the chin and throat whitish, the chest being washed with fulvous. The change to the nuptial dress takes place by an alteration in the feathers, the tips first assuming the yellow and black colours respectively.

Adult female. Length 5·3 to 5·6 inches; wing 2·4 to 2·6; tarsus 0·75. Soft parts as in the winter male, and the plumage similar. There is frequently a yellowish hue on the eye-stripe and about the chest and throat.

Young. On leaving the nest the bill is brownish fleshy, with the margins yellowish.

Upper surface dark brown, edged with fulvous-grey, most broadly on the wing-coverts and tertials; supercilium buff; chin and lower parts whitish; the breast fulvous; lower parts whitish.

A young female (10th October) has the head- and back-feathers edged with tawny, the rump fulvous-brown; tail pale brown, the bases of the feathers with yellowish edges; primaries margined with yellowish-grey margins; a broad fulvous supercilium; ear-coverts brown; cheeks fulvous, spotted with brownish; chin and throat white; chest and flanks tawny fulvous, with dark *narrow* shaft-stripes at the sides of the chest and on portions of the flanks; lower parts whitish; under tail- and under wing-coverts buff. This example is in moult, but not losing the quill- or tail-feathers.

In the following July *immature females* want the dark shaft-stripes on the chest, a few being only visible on the sides; the throat and chest are delicate tawny yellowish; the lesser wing-coverts conspicuously tipped with whitish, and the greater margined and tipped with the same; primaries and tail-feathers narrowly edged with yellow. An

immature male of the same month, probably bred late in the preceding autumn and not about to breed, has the upper-surface feathers margined with a less tawny hue than the above, and the centre of the fore neck and sides of chest with conspicuous, though very fine, dark shaft-stripes, and has no trace of a yellow tinge on the lower surface. This specimen has some resemblance to the Striated Weaver-bird; but I have compared it with skins of the latter, and the striæ are not of the same character at all, but resemble those on the flanks of adult individuals of the present species.

Obs. A Malabar skin of this bird in breeding-plumage has the yellow of the head and chest of a deeper hue than almost any I have seen from Ceylon; but another from "Madras" is identical with a male in my own collection.

The specific name *philippinus*, which I here employ and which appears to be the correct one, is not aptly applied to our Indian species, and is, in fact, an inappropriate name altogether, as the bird is not found in the Philippine archipelago. The Indian-peninsular form has of late years been usually styled *P. baya*; but Mr. Hume now considers that Blyth applied this name to a large race with a differently coloured chest, which occurs in Nepal, Sikhim, Eastern Bengal, Burmah, and the Malay peninsula. The late Marquis of Tweeddale and Mr. Hume are of opinion that Linnæus's name applies to the common Indian Weaver-bird; and after perusing the remarks of the former, written in his admirable paper on the birds of the Philippine archipelago, I think that there is little doubt that the species so named by Linnæus was no other than the present. The Marquis first of all points out that there is no Weaver-bird in the Philippines, and then remarks that, according to Buffon, D'Aubenton's figure was taken from a male example of Brisson's *Coccothraustes philippinensis*, on which Linnæus founded *Loxia philippina*; Brisson's description completely agrees with *P. baya*, Blyth, and cannot, as some think, apply to *P. hypoxanthus* of Indian authors. Furthermore, Brisson describes and figures the nest of his Weaver-bird, which is unmistakably that of *P. baya*.

Mr. Hume writes that the larger form, his presumed *P. baya* of Blyth, differs from the true *philippinus* in the much more rufescent character of its lower plumage; and he is also of opinion that the males do not assume the yellow breast in the breeding-season. He recognizes a third form in his *P. megarhynchus* (Ibis, 1869, p. 356), which has an immense bill for its size, measuring 0·84 to gape, and in the wing 2·95 inches, and differs from *P. philippinus* "in the darker and more rufescent tone of the entire plumage, and in the almost entire absence of striations on the crown, the much broader and sparser striations of the back, with entire absence of any rufous or rufescent supercilium, and in the cheeks and ear-coverts being unicolorous with the rest of the sides of the head and nape."

Distribution.—The Baya is common throughout all the low country, but I have always found it more numerous in the maritime provinces than in the interior. It is very local, keeping in large flocks to certain spots for some time, breeding in them, and then disappearing for months at a time, during which it occupies other localities suited to its habits; and this wandering disposition has caused some to think that it is migratory. It is, I think, more frequently met with in the south and west than in the north of the island, although I seldom failed to find flocks of it at all seasons frequenting the open country surrounding the salt lagoons and estuaries in the Trincomalie district; and I have likewise met with it in similar spots in the neighbourhood of Hambantota and Batticaloa, so that it cannot be said to be very much more partial to the west than the east side of the island. In the Anaradjapura district Mr. Parker has met with it not unfrequently, and at Uswewa he says it is not uncommon. I have seen it in the Kurunegala district, and at Chilaw I found it in large flocks. About Colombo I have met with it as near to the town as Cotta, where it breeds, as it likewise does occasionally at Borelesgamuwa. I am not aware that it has been found in the hills.

This Weaver-bird is found throughout peninsular and continental India, and would appear, from Mr. Hume's first writings on the subject, to extend to Burmah and Tenasserim, although from later disquisitions in 'Stray Feathers' it would appear that he identifies the bird inhabiting those regions with what he considers Blyth's true *P. baya* from Nepal, Sikhim, and Eastern Bengal. In the first list of Tenasserim birds ('Stray Feathers,' 1874) we find that the *Ploceus baya* of the province is "identical with continental Indian specimens," by which I understand the smaller race with the pure yellow breast. Again, in the "Birds of Pegu," *t. c.* 1875, it is written :—"Specimens from Thayetmyo agree well with others from all parts of India." But in the "Birds of Tenasserim" (Str. Feath. 1878) we find all the specimens of this type entered as true *baya*, Blyth, *apud* Hume, which is stated to inhabit Nepal and Sikhim, Eastern Bengal and Burmah, and not continental India. This matter apparently requires elucidation. At any rate our Ceylonese bird is found in suitable places in Southern India, and is common in the Deccan, from which the Rev. Dr. Fairbank records it; in the north-west it is common at the Sambhur Lake and in the plains

round Mount Aboo in the cold season, and also in the surrounding districts, according to Mr. Hume. It has lately been added to the avifauna of Sindh on the evidence of a single specimen procured in the Kurrachee collectorate. Crossing the empire to the eastward, we find it in the North-west Provinces and Central Bengal, and throughout Chota Nagpur, where Mr. Ball found it abundant. In the region lying along the east coast between the Ganges and the Godaveri, the same writer records it from many places, such as Bardwan, Manbhum, Lohardugga, Singhbhum, Orissa, south of Mahanadi, Nowagarh, and Karial; and Mr. Hume notes it from Raipur and Sambalpur in the same district. From Furreedpore, Eastern Bengal, Mr. Cripps records a *Ploceus* in abundance, but, not having kept specimens of it, he is unable to say whether it was the continental Indian or the Nepal bird.

Habits.—This Weaver-bird is found about the borders of open land or scrubby wastes in the vicinity of water more frequently than away from it. It affects low trees, palms, strips of jungle between paddy-fields and the like, and congregates in large flocks, which keep up an incessant chattering and a repetition of long-drawn sibilant whistles on the part of the males, which appear to be uttered as an encouragement to the females during the process of building their laboriously constructed nests. The energy displayed, particularly on the part of the male, in the construction of these wonderful structures, and the extraordinary aptitude which they show for learning the tricks so well known in India, entitle the Weaver-bird to a high place among the intelligent members of the feathered creation. A young pair which I endeavoured to rear at Galle, but which fell a prey to rats, displayed signs of unusual intelligence at a very early age. As soon as they were fledged they recognized me, and knew well when to expect their food, fluttering along the floor when let out of their cage, and scrambling up my legs into my lap to get fed.

The account by Blyth of the performances of the Baya in India, which is quoted in Jerdon, is so interesting that I cannot do better than transcribe it here for my readers. After stating that exhibitors carry them about to all parts of the country, he says:—"The usual procedure is, when ladies are present, for the bird, on a sign from its master, to take a sweatmeat in its bill and deposit it between a lady's lips, and repeat this offering to every lady present, the bird following the look and gesture of its master. A miniature cannon is then brought, which the bird loads with coarse grains of powder one by one, or more commonly with small balls of powder made up for the purpose; it next seizes and skilfully uses a small ramrod, and then takes a lighted match from its master, which it applies to the touch-hole." He further remarks, "We have seen the little bird apply the match five or six times successively before the powder ignited, which it finally did, with a report loud enough to alarm all the crows in the neighbourhood, while the little Baya remained perched on the gun, apparently quite elated with its performance."

The Baya has a strong rapid flight; it roosts in flocks, and not unfrequently resorts to large reed-beds, in common with the next species, and there takes up its quarters for the night in company with flocks of Munias. It is very destructive in paddy-fields, establishing itself in the vicinity of these in large colonies, and feeding greedily on the grain. Its movements about the country are no doubt regulated, to a certain extent, by the time of harvest in different districts; and when it takes up its quarters in the vicinity of large paddy-fields before they are cut, it usually takes advantage of the abundance of material and commences to breed, constructing its nest of the blades of corn.

Nidification.—In the south-west and south of Ceylon the Common Weaver-bird breeds from May and June until August, and in the north from October until January. It chooses trees standing in open places or on the borders of fields, cheenas, lakes, &c., and nearly always associates in a large flock, which make their nests in adjacent trees, suspending from one to a dozen or so to the branches of each, the whole number accommodating a very large and noisy colony of these busy little architects. At times they will choose a river-bank or a hanging wood on a hill-side overlooking some extensive or perhaps secluded paddy-field, and then the sight of the many pendent nests swaying perchance to and fro with the wind, as one looks up at them from the open beneath, is very interesting. Much has been written about the nidification of the Weaver-bird, and there must be few inhabitants in Ceylon who are not familiar with its wonderful nest, the most striking part of which is the long entrance-tube, which attains *occasionally* a length of 4 feet! The nest is composed of those materials which are abundant on the spot chosen by the colony. I have seen a whole batch of nests constructed

of fine strips of date-palm leaves, another of cocoanut fronds similarly treated, and others of strips of bamboo when they were suspended from that tree overhanging water. Again, blades of green paddy are as often used as any thing else, for the borders of the fields are frequently chosen for the breeding settlement. In the southern province I think the date-palm leaf is as frequently chosen as any thing else, as it abounds in that district and forms a very durable material.

I have seen a structure containing two completely formed nests connected by a tube of about 18 inches in length, the whole measuring nearly 6 feet.

On referring to my account of the nesting of this species in Ceylon, communicated to the Royal Society of Tasmania, I find the details which I here subjoin:—"The strips of which these wonderful structures are composed are about $\frac{1}{10}$ inch broad, and are torn off the palm-frond in the most dexterous manner by the hard-working little 'Weavers.' The bird alights near the base, and with a bite and twist of its bill quickly detaches the end of the desired piece, launches itself out into the air, and after a momentary flutter succeeds in tearing it off, and wings its way back to the nest. The neck, or part which connects the egg-compartment with the branch or leaf (as the case may be), varies from 6 inches to more than a foot in length, and is, in general, about 1 inch in diameter; at the bottom it suddenly expands into the peculiar flattened 'goblet' or retort-shaped mass which contains the nest itself and the origin of the entrance to it. It is during the formation of this part that the extraordinary ingenuity and highly-developed constructive powers of the male bird in particular are exemplified. Carrying a long strip of material in its bill, it alights on the nest, and quickly weaves in one end; then taking a little hop forwards, it stretches itself out to the utmost, and, seizing the blade as far out as it can, runs its bill along it till it catches the end, which it underlaces in like manner, the whole operation occupying a few seconds only. It then frequently hops to another part, and clinging on with its claws, reaches itself out and carefully inspects its work, tucking in any projecting ends that it may observe. The body of the nest takes from four to five days to construct; and when the widest part has been reached, a strong loop is thrown across the bottom *a little at one side of the centre*, giving the nest, as Jerdon remarks ('Birds of India'), the appearance, when taken from the tree and inverted, of a basket with a handle. It is curious how many people have erred in noting the use of this loop, some being of opinion that it is meant for the male bird to sit upon in what has been equally erroneously described as the *male nest*! It is the keystone to the whole structure, and, of course, exists in all nests, the *construction of it being the principle on which the egg-compartment* is separated from the entrance or 'spout,' and if examined will be found attached to the interior walls by strong buttresses running up for a couple of inches. On one side of this loop, therefore, the egg-receptacle is formed by bringing down the exterior of the nest and then working it up to the loop again, while the opposite side is built down into the form of a tube or spout, the loop then constituting merely the edge, over which the bird has to mount to enter the egg-chamber. . . . . . . This 'spout,' or tubular entrance, varies in length according as the *passion for building*, if I may so describe its instinct, exists to a greater or less degree in the male bird, as it is nearly always continued by him after the female bird has commenced to lay, and in some cases after she has commenced to sit. It is generally about 18 inches or 2 feet long, but occasionally only about 6, and rarely attains the great length above mentioned." During the time the egg-compartment is being built, the pieces of clay are attached, about which there are so many different theories. Layard suggests that it might be for sharpening the bird's bill on; the natives of India have an idea (Jerdon, *loc. cit.*) that they are intended to stick flies on in order to light up the compartment at night! Jerdon himself was of opinion that they are used for the purpose of steadying the nest, and preventing its being knocked about by the wind. From my own observation I find that these lumps of clay are but seldom used in Ceylon, perhaps because they do not build during the windiest months in the year; and I have noticed that in a whole colony of nests built in a sheltered hill-side no clay was used. It is probable, therefore, that Jerdon's theory is the correct one. During the time the Weaver-birds are building, the whole flock keep up an incessant chirping, varied now and then by the long grating whistle uttered by the male as he clings to the nest he is making. Many nests are deserted when the body is being constructed, both before and after the loop has been formed; and this is, according to some writers, to furnish the male with a roosting-place. This is, I think, an erroneous idea: the proportion of such nests is sometimes only three or four to a large colony; and it seems to me probable that they are rejected by the birds on account of some fault in their construction—the egg-chamber too small, the

neck not strong enough, or some such weak point. I am strengthened in this view from having observed, as above stated, how particular the male bird is at times in examining and inspecting his work; and under these circumstances it is only natural that badly-made nests would be deserted. Again, as Jerdon remarks (*l. c.*), these nests may be "simply the efforts, if built late in the season, of that *constructive faculty* which appears to have such a powerful effect on this little bird, and which causes some of them to go on building the long tubular entrance long after the hen is seated on her eggs."

I have generally found the number of eggs laid by the Baya to be three or four; they are long ovals in shape, and of a pure but glossless white colour, quite unspotted. They average in size about 0·9 by 0·65 inch.

On entering the nest the old birds fly to the bottom of the tube, and, closing their wings, run up to the egg-chamber with surprising rapidity. I have several times witnessed this performance and carefully noted it, particularly as it has been said that the bird *flies up the tube*. Jerdon, in his admirable account of this bird's nesting, writes that, "when the loop is completed, the female takes up her seat on it, leaving the cock bird to fetch more fibre and work from the outside of the nest while she works on the inside, drawing in the fibres pushed through by the male, and reinserting them in their proper place, and smoothing all carefully."

PLOCEUS MANYAR.

(THE STRIATED WEAVER-BIRD.)

Fringilla manyar, Horsf. Trans. Linn. Soc. xiii. p. 160 (1820).

Ploceus manyar (Horsf.), Blyth, Cat. B. Mus. A. S. B. p. 115 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 257; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 514 (1856); Jerdon, B. of Ind. ii. p. 348 (1863); Hume, Str. Feath. 1873, p. 208; Hume, Nests and Eggs, ii. p. 440 (1874); Oates & Hume, ibid. 1875, p. 154; Butler & Hume, *t. c.* p. 495; Butler, ibid. 1877, p. 221; Davison & Hume, ibid. 1878 (B. of Tenass.), p. 401; Ball, ibid. vii. p. 222; Cripps, *t. c.* p. 292.

?*Ploceus bengalensis*, Kelaart, Prodromus, Cat. p. 125.

Ploceus striatus, Blyth, J. A. S. B. 1842, xi. p. 873; Holdsw. P. Z. S. 1872, p. 463.

The Black-throated Weaver-bird; *Black-breasted Weaver-bird* of some. *Bamani Baya*, Hind., Deccan; *Telia Baya*, Bengal.; *Bawoyi*, in Rungpore; *Manyar*, Java.

Adult male and female. (British Museum, "India") Wing 2·7 to 2·81 inches; tail 1·9 to 2·0; tarsus 0·7 to 0·8; middle toe 0·65, claw (straight) 0·28; bill to gape 0·65, height at nostril 0·38. Length 5·8 inches (*Jerdon*).

(Java) Wing 2·7 to 2·8 inches; tail 2·0; tarsus 0·8.

Iris brown; bill "black" (*Jerdon*); legs and feet fleshy.

Breeding-plumage. Head and crown rich glistening yellow, forming a point on the nape; cheeks, ear-coverts, chin, and throat brownish black; hind neck, interscapular region, and scapulars blackish brown, the feathers margined with tawny; back, rump, and upper tail-coverts lighter brown than the hind neck, with paler margins to the feathers; wings and tail brown; the inner secondaries broadly edged with fulvous; the primaries and tail-feathers

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PADDA ORYZIVORA.

(THE JAVA SPARROW.)

Loxia oryzivora, Linn. Syst. Nat. i. p. 302 (1766).

Amadina orizivora (L.), Blyth, Cat. B. Mus. A. S. B. p. 118 (1849).

Munia orizivora (L.), Bonap. Consp. Gen. Av. p. 451 (1850).

Padda orizivora (L.), Hume, Nests and Eggs. ii. p. 454 (1874).

Fringilla orizivora, Bligh, J. A. S. (Ceylon Branch), 1874, p. 67.

The Java Grosbeak, Latham. *Glate*, Java; *Gelatik*, Sumatra (Horsf.); *Ram Gira*, in Bengal (Blyth).

Adult male. (Ceylon, December 1870) Length 5·8 inches; wing 2·7; tail 1·8; tarsus 0·75; middle toe and claw 0·8; bill at front 0·6.

(Java, Lombok, Tenasserim) Wing 2·6 to 2·8 inches; tail 1·9; tarsus 0·65 to 0·75; middle toe 0·6; bill to gape 0·5.

Iris red; bill fleshy red at base, paling to fleshy towards the tip; legs and feet fleshy.

Entire head and gape black, encompassing a large white patch which covers the cheeks and ear-coverts; upper surface, wings, entire neck, and chest delicate dove-grey; primaries tinged with brown; upper tail-coverts and tail black, the tail less intense than the coverts; breast, belly, and flanks isabelline red, blending into the grey of the chest; vent and under tail-coverts white.

A Lombok example has the breast and abdomen darker red than one from Java; a specimen from Tenasserim is albescent on the abdomen.

Obs. A handsome species allied to this one is *P. fuscata*; it has the head and throat black, enclosing a similar white

narrowly margined with dull yellowish; chest and flanks tawny, with *deep brown central stripes, rather broad on the chest*, and narrowing gradually on the flanks; the centre of the breast, abdomen, and under tail-coverts albescent. Examples appear to vary in the intensity of the colouring of the throat and in the amount of striation on the chest.

Nonbreeding-plumage (Burmah). Head and upper parts blackish brown, the feathers edged with tawny; a light stripe over the eyes; lower part of the cheeks and the throat whitish, tinged with yellow; breast and flanks striated darkly, as in breeding-plumage.

An example beginning to change to breeding-dress has the eye-stripe and a patch above the ear-coverts light yellow, and the throat-feathers changing to black along the shafts.

Female. Length 5·4 inches; wing 2·65; tail from vent 1·85; tarsus 0·91; bill from gape 0·63 (*Oates*).
"Iris brown; eyelids grey; bill yellowish horny, darker on the upper mandible; legs fleshy; claws pinkish."
Similar to the male in winter plumage.

Obs. I see no difference in Javan and Indian examples of this bird, and I conclude it was with the latter that Blyth compared Layard's skins sent from Ceylon. Horsfield's description is very meagre, and was perhaps taken from a young bird breeding, or it may be simply a case of the incomplete style of description in vogue at the beginning of the present century.

Other species of *Ploceus* inhabiting the Indo-Malaccan region are *P. bengalensis*, from Bengal, Assam, and Burmah, and *P. javanensis*, Lesson, = *H. hypoxanthus*, Daudin. The former differs in breeding-plumage from our bird in having the chin, throat, and face white, with a broad black pectoral band reaching upon the sides of the neck; the head and occiput are pale but brilliant yellow; the wing-coverts, scapulars, and back brownish black, margined with greyish; wings and tail brown; under surface from the chest buffy white; flanks brownish, with dark shafts to the feathers. The *female* has the head and hind neck uniform brown; a pale supercilium; throat yellowish; a blackish pectoral band, with the feathers in the centre terminated with whitish, giving it a broken appearance. *P. javanensis* is a very handsome species, with the head, the sides of the neck, and the entire under surface brilliant chrome-yellow; throat and cheeks black, and the yellow of the chest just beneath the black tinged with tawny; the rump, upper tail-coverts, and edges of the back, scapulars, and wing-covert feathers paler yellow than the head; wings and tail brown.

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cheek-patch, and the parts which are slate-grey in this species are ruddy brown in it; breast and lower parts white, divided from the brown chest by a blackish border; wing 2·4 to 2·5 inches.

Distribution.—This well-known bird, which is largely imported into Ceylon as a cage-pet, has been successfully acclimatized in Ceylon.

It is now no uncommon occurrence to meet with a small flock on the compounds surrounding the Colombo Lake. I saw one in the pretty grounds of the bungalow belonging to the Messrs. Green, of Colombo, in April 1870; and my friend Mr. J. P. Green informs me that he saw a few near the house last year. They are, however, frequently seen in other places in the neighbourhood of Colombo, and have even been introduced into some of the coffee-districts, where they are, it appears, thriving as well as in Colombo. Mr. Bligh writes, from Kotmalie, in the Ceylon As. Journal for 1874:—"I have frequently seen them in the jungle, where they are so wild, and keep to the tops of the highest jungle-trees in inaccessible places, that I have not yet been able to obtain a specimen; they seem to be quite at home in this wild district."

Jerdon states that it has been turned out so much near Madras that it may be seen wild there. It occurs in Tenasserim, whence I have seen examples in the British Museum; and Blyth states that Major Berdmore procured it in the Mergui province. In Malacca it is common. It is found abundantly in Java, and also in Sumatra, in the Lampong district of which latter island Mr. Buxton lately procured it. Further east than Java it has been obtained in the island of Lombok; and no doubt it occurs in other islands of the great chain which terminates with Timor. It has been introduced into St. Helena, and, according to Mr. Melliss, is numerous there.

Habits.—This bird appears to affect trees as much as the nearly allied Munias resort to the ground. It flies swiftly, and is restless and shy. In confinement it is as docile as all birds of its kind, and it is consequently a favourite cage-pet. It feeds on the ground, tripping quickly on the grass, and it clings, with the agility of its family, to stalks of grain, to which it is no doubt very destructive during harvest-time.

Distribution.—According to my observations the Striated Weaver-bird is not a common bird in Ceylon. Layard, who discovered it in the island, remarks, "I found it replacing *P. philippinus* in the neighbourhood of Tangalla;" and, alluding to the possibility of Kelaart having seen it at Trincomalie, suggests the probability of the species extending round the east coast to that place. I think I met with a flock once at a tank in the Trincomalie district; but, as I was unable to procure a specimen, I am unable to record it with certainty. I likewise saw what may have been this species near the Wallaway river; but unfortunately it did not occur to me at the time, although they were frequenting a reed-bed, that they were not the Common Weaver-bird, and I allowed them to pass unmolested! In both these localities, particularly at Trincomalie, the latter species is found not unfrequently, so that no dependence can be placed on my surmise. There is, if I mistake not, a specimen in the Colombo Museum, shot near Borelesgamuwa. I have never seen it in any collections, nor heard of it having been procured in any part of the island other than the localities above mentioned.

On the mainland of India this species has, it would appear, quite as extensive a range as the last, for, in addition to being diffused throughout the peninsula, it extends on the one side as far north as Sindh, and on the other into Burmah, and thence as far south as Tenasserim, where it is found between the Sittang river and Salween. Mr. Davison obtained it on the Thatone plain, where, from his remarks, it was not plentiful. In the south of India Mr. Bourdillon met with it near Trevandrum, in southern Travancore. Jerdon remarks that it is rare in the Deccan, and I observe that it has not been recorded from there by recent observers; in addition to which Mr. Hume states that it is not common in Southern India. In the north-west Captain Butler met with it at Milana, near Deesa; but it does not seem to be common in that district. In Sindh, according to Mr. Hume, it is plentiful; he writes, "Everywhere in the giant flowering-grasses, so common in the neighbourhood of Shikarpore and other similar localities in Upper Sindh, this Weaver-bird is seen in large parties" in that province. It breeds only where there are large sheets of water, as is the case in other districts of Northern India. It is found at Etawah, breeding there, as also in the Aligurh, Mynpoorie, and Cawnpore districts. Further east and to the south Mr. Ball records it from Orissa, north of the Mahanadi; and in the Furreedpore district Mr. Cripps says that it is very common. As regards Pegu, Mr. Oates says "this species is scarcely less common about Thayetmyo than *Baya*;" but in the Irrawaddy delta Mr. Armstrong did not meet with it. It is found in Java, having been described from there by Horsfield; but in Borneo it has not been as yet observed; in fact the genus *Ploceus* does not find a place in Salvadori's 'Uccelli di Borneo'; neither can I find any mention of it in Sumatra; but in the district of Lampong the Malayan race of the Indian *Baya*, entitled *P. maculatus*, P. L. S. Müller, by Lord Tweeddale, occurs.

Habits.—This handsome Weaver-bird has a partiality for long grass in open country and reeds near water, in one or other of which it is usually met with. But little has been written concerning its habits except as regards its nidification, which is almost as interesting as that of the last species. The birds which I hesitatingly identify as the Black-throated Weaver-bird were congregated in a large flock about reeds and rushes, and were as noisy as the common species, flying up and settling down again continually. Mr. Hume found its food to consist of insects as well as grass-seeds, and writes as follows concerning its habits in Sindh:—"Half a dozen may be seen perched close side by side upon the topmost sprays of the largest grass-stems, which, curved slightly beneath their weight, sway backwards and forwards at every passing breath, apparently much to their satisfaction. No sooner, however, are half a dozen comfortably placed than a dozen others insist on sharing the perch; great is the commotion that ensues, down bends the grass-stem and off they all fly, to resume the same game on some other stem; and so they will go on continuously for half an hour."

Nidification.—The Striated Weaver-bird breeds in Upper India in August and September, building a nest of the same character as the last species, suspended from high reeds or bulrushes. Great numbers are often placed close together; Mr. Hume writes of having found nearly a hundred in a small bulrush island not 20 yards in diameter. He thus describes the nests:—"They are formed of the same materials" (as those of *P. philippinus*) "and woven in the same manner; but the upper or body portions are more massive and clumsier, and the tubes are shorter. The points of some forty or fifty narrow bulrush-leaves are commonly gathered together and incorporated into the upper portion of the nest to form a point of suspension. The true nest, exclusive of the tubular entrance-passage, averages about $7\frac{1}{2}$ inches in length externally, with a

diameter of 5 inches one way by 4 the other. The tube is from 2 to 5 inches in length, and about $2\frac{1}{2}$ inches in external diameter; the upper portion of the nest may be about $1\frac{1}{4}$ inch thick, but the sides average about half an inch, and the entrance-passage is scarcely a quarter of an inch thick. What gives the nest a clumsy appearance is that its upper end terminates squarely, instead of tapering more or less to a point, as is the case with those of *P. philippinus*; but then the nests of these latter are hung from a point of support." The eggs are usually two or three in number, and are slightly smaller than those of the last species. They are "moderately broad ovals, a good deal pointed towards one end, and of a perfectly pure glossless white." The average size of the eggs is 0·8 by 0·58 inch.

The colony I met with near the Wallaway river, and which, I presume, was one of this species, were nesting in the reeds; the nests corresponded to the above description, and many of them had pieces of clay attached to them. What could this have been for, except to add weight, and thus prevent the swinging to and fro of the nests?

Genus MUNIA*.

Bill much as in *Ploceus*, but more inflated between the nostrils and the margin, which is festooned; gape much angulated; culmen running back on the forehead in a point. Wings with the 1st quill *very minute*, the next three nearly equal in length, but variable, the 2nd of them usually the longest. Tail rather short, cuneate. Tarsus stout, scarcely exceeding the middle toe without its claw; middle toe much longer than the lateral ones, which are subequal, the outer being slightly the longer.

Of small size and gregarious habit; often building in company like the Weaver-birds.

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* It will seem strange to many of my Ceylon readers to remove these little birds from among the Finches, with which one is always inclined to associate them; but, in addition to their possessing a minute or rudimentary first primary, they are, in other respects, more like the "Weavers" than the true Finches, to the former of which they assimilate in outline and structure of bill, and in the short tail and legs; and, furthermore, they are highly gregarious and often nest in company: to the latter they merely bear a superficial resemblance in the matter of their conical bill and small size.

MUNIA KELAARTI.

(THE HILL-MUNIA*.)

(Peculiar to Ceylon.)

Amadina pectoralis, Blyth, J. A. S. B. 1851, xx. p. 178; Kelaart, Prodromus, Cat. p. 126 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 258.

Munia kelaarti, Blyth, MS.; Jerdon, B. of Ind. ii. p. 356 (1863); Blyth, Ibis, 1867, p. 299 (orig. descrip.); Holdsw. P. Z. S. 1872, p. 464.

The Nuwara-Elliya Finch, Kelaart; *Ortolan, Hill Paddy-bird*, Europeans in Ceylon.

Wé-kurulla, lit. "Paddy-bird," Sinhalese; *Tinna kuruvi*, Tamil (Layard); *Pastro de Neli*, Portuguese in Ceylon.

Ad. suprà chocolatino-brunneus, pilei dorsique plumis angustissimè medialiter albido lineatis: alis nigricantibus, tectricibus interioribus secundariisque brunneis: uropygio et supracaudalibus nigris, scapis albis, et subterminaliter maculâ albâ ornatis, supracaudalibus longioribus aureo-fulvo terminatis: caudâ saturatè brunneâ: loris, facie laterali et gulâ nigris: regione paroticâ posticâ et colli lateribus pallidè cervino-brunneis angustissimè medialiter albo lineatis: corpore reliquo subtùs albo nigroque maculatim marmoratis, plumis albis nigro latè fasciatis et marginatis: subcaudalibus nigris latè albo medialiter lineatis: rostro nigro, mandibulâ basaliter cyanescente: pedibus fuscescenti-plumbeis: iride brunneâ.

Adult male and female. Length 4·65 to 4·8 inches; wing 2·1 to 2·25; tail 1·6 to 1·8; tarsus 0·5 to 0·6; middle toe and claw 0·75; bill at front 0·5, to gape 0·45 to 0·48.

In this species the bill is somewhat flatter above and the culmen less arched than in the other Ceylonese members of the genus.

Iris sepia-brown; bill blackish leaden, bluish at the base of lower mandible; legs and feet plumbeous, in some with a greenish tinge.

Forehead, cheeks, throat, and fore neck glossy brownish black, paling on the head, and changing on the hind neck, back, and scapulars into a woody or fulvous brown; the feathers on these parts with whitish or fulvous striæ (according to the hue of the back), those of the sides of the neck and under surface likewise with white striæ; wings, upper tail-coverts, and tail brownish black, the tail-coverts with central arrow-headed white spots, the longer feathers glistening ochre-yellow at the tips; below the ear-coverts the sides of the neck are pale fawn, continued down to the sides of the breast; breast and lower parts white with black edges, and two more or less oval black spots on each side of the shaft, imparting a curious chequered appearance; the black is of greater extent on the flanks; under tail-coverts black, with broad white centres, which in some specimens take the form of bars. In specimens in abraded plumage the under surface is much lighter.

Young. Upper surface uniform dark brown, wanting both the striæ of the back and the white barring of the upper tail-coverts; upper tail-coverts plain brown; throat black, barred with white; fore neck and under surface tawny fulvous, with indistinct black lunulations; under tail-coverts buff, barred with black.

Obs. This species was at first confounded by Blyth with *M. pectoralis* from the hills of Southern India, inasmuch as he was under the impression that it was the adult of that Finch, to the young of which Jerdon had given this title. He afterwards gave it a MS. name, and in his paper on Ceylonese birds ('Ibis' 1867) fully described a specimen of it. It is, in fact, the Ceylonese representative of *M. pectoralis*. This latter, which is found in the

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* I have chosen the term Munia for the English name of these little "Amaduvads." It is employed by Jerdon, in his 'Birds of India,' as being, I conclude, shorter than Amaduvad, the term generally applied to the genus by Europeans in India. Hodgson first gave the name as a generic one, and remarks in the 'Asiatic Researches' concerning it:—"*Munia*, the name we have assigned to these birds, is well known to the Tarai and to the Hills as the generic appellation of several species of tiny gross bills, distinguished for their familiarity with man, their gregarious habits, their depredations upon the rice-crops, and their ingenious nests."

HIRUNDO HYPERYTHRA.
MUNIA KELAARTI.

Wynaad, Coorg, Travancore, and other hills, has the throat and chest deep brownish black, and the underparts, from the breast downwards, a salmon or reddish-fawn colour, without any dark markings; the upper parts are dark brown, the feathers with pale yellowish shafts.

Distribution.—This handsome little Finch, the only species of the family peculiar to the island, was discovered by Dr. Kelaart at Nuwara Elliya, where it is very common, and by him specimens were forwarded to Blyth. It is essentially an alpine bird, not being found below an altitude of about 2000 feet, and is not very numerous at that height. Its principal habitat is the Nuwara-Elliya plateau and the western coffee-districts extending from the Peak forest (in clearings in which it is common), through Maskeliya, Dickoya, Dimbulla, and Pusselawa, to parts of the Kandy district, and thence to the Knuckles, in the upper parts of which it is found, but not, according to my observation, as commonly as on the south side of the Dumbara valley. In Uva, about Badulla, and in Madulsima I found it less numerous than *M. malacca*, which is the common patna Finch of that part. In Maturata and Hewahette it is tolerably frequent, but not more so than *M. striata.* In the southern ranges (the Rakwana, Morowak, and Kukkul-Korale district) it is found above the altitude mentioned. I observed that it was numerous in the hill-fields and small clearings about the hamlets on the wilderness of the Peak.

Habits.—The Hill-Munia, in its habits, differs considerably from all the succeeding species. It is frequently found in the interior of the gloomiest forests; it is unsociable, living for the most part in pairs or in very small parties of three or four, except at night, when it comes together in flocks to roost; it is likewise a bird of more rapid flight than other Munias, Nature having afforded it the power of spanning the deep ravines and gorges, among which it passes its life, with ease and rapidity. It darts swiftly across open coffee-estates and patnas from one piece of jungle to another with an undulating flight, uttering a long-drawn, sibilant note, which is audible at some distance, and is often heard without the swiftly flying little "Finch" being itself perceived. It feeds on small seeds, frequenting the tall patna-grass when it is in flower, and resorting to the kurrukan clearings in the Peak forest and Kukkul Korale, where it gorges itself with the grain of that plant. I have noticed it in the early morning about the outhouses at Nuwara Elliya picking, like Sparrows, on dunghills and rubbish-heaps; and Mr. Holdsworth likewise observed it feeding on the roads there like Sparrows on whatever it could find. When not feeding it is both shy and restless. During a sojourn in the Peak forest I observed that its appetite was satisfied at an early hour in the evening, and that it then commenced to roam about and settle on dead trees, coming home from its feeding-grounds one by one, and appearing to take some pains to find a good roosting-place.

Nidification.—The "Nuwara-Elliya Finch" breeds from May until September, nesting often in the upper branches of lofty, umbrageous trees, and at other times in coffee- and other low bushes, as well as in the creepers trained up the verandahs of bungalows on the estates. Mr. Bligh informs me that he has known a pair take possession of a Bulbul's nest, from which the rightful owners had been driven, and construct therein a nest of their own. I noticed, with regard to a pair breeding in that gentleman's verandah at Catton, that the female was a very close sitter, and returned to her nest shortly after being disturbed.

This was in May; and in July following Mr. Bligh writes me:—"On the 16th I saw the Munia fly out of the old nest in the verandah, and when I put my finger in the nest I found two eggs in it; the old bird was then sitting on them. I think it worth recording that they lay so soon after having reared their first brood. I noticed that occasionally the young and old returned to the nest to sleep; they did not make a practice of it; it seems to be only when they take it into their heads to do so; or it may be that the old birds are thinking of another brood and begin to visit the nest for that purpose, and tolerate the presence of the first brood while they are still young."

The nest is made of grass, and usually globular in shape; it is compact, and has a rather neatly rounded entrance. The egg-cavity is deep and round, and lined with fine grass. The eggs are pointed ovals, pure white, and glossy in texture. They measure from 0·65 to 0·68 inch in length, and 0·44 to 0·46 inch in breadth.

The figure in the Plate is that of a specimen shot in the Peak forest.

MUNIA MALACCA.

(THE BLACK-BELLIED MUNIA.)

Coccothraustes javanensis, Brisson, Orn. iii. p. 237 (1770).
Loxia malacca, Linn. Syst. Nat. i. p. 302 (1766).
Spermestes malacca, Jerdon, Cat. B. S. Ind., Madr. Journ. 1839, xi. p. 27.
Amadina malacca, Blyth, J. A. S. B. 1846, xv. p. 285; Kelaart, Prodromus, Cat. p. 125 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 258.
Munia malacca, Blyth, Cat. B. Mus. A. S. B. p. 116 (1849); Jerdon, B. of Ind. ii. p. 352 (1863); Holdsw. P. Z. S. 1872, p. 464; Hume, Nests and Eggs, ii. p. 443; Legge, Ibis, 1874, p. 25, et 1875, p. 398.
White-breasted Indian Sparrow, Edwards, Gleanings, p. 301, pl. 355.
Malacca Grosbeak, Latham; *Malacca Finch*, Kelaart; *Black-headed Munia*, Jerdon; *The Chestnut-backed Munia* of some; *Paddy-bird*, *Ortolan* in Ceylon. *Nakal-nor*, Hind.; *Nalla jinuwayi*, Telugu (Jerdon).
Wé-kurulla, Sinhalese; *Tinna kuruvi*, Tamils; *Pastro de Neli*, Portuguese in Ceylon.

Adult male. Length 4·6 to 4·8 inches; wing 2·1 to 2·3; tail 1·5 to 1·6; tarsus 0·7; middle toe and claw 0·65 to 0·8; bill to gape 0·45, at front 0·5, height at nostril 0·34; hind toe 0·35, claw (straight) 0·3. Birds from the hills appear to average larger than low-country individuals.

MUNIA RUBRONIGRA.

(THE CHESTNUT-BELLIED MUNIA.)

Munia rubronigra, Hodgson, As. Res. xix. p. 153 (1836); Blyth, Cat. B. Mus. A. S. B. p. 116 (1849); Holdsw. P. Z. S. 1872, p. 464; Layard, P. Z. S. 1873, p. 205; Legge, Ibis, 1874, p. 25.
Amadina rubronigra, Layard, Ann. & Mag. Nat. Hist. 1854. xiii. p. 258.
Munia atricapilla (Vieill.), Hume, Nests and Eggs, ii. p. 444 (1874); Salvadori, Ucc. d. Born. p. 265 (1874).
Pora Munia; *Nuk roul* at Mussouri (Blyth).

Adult male and female. Length "4·5 inches" (*Jerdon*); wing 2·1 to 2·2; tail 1·6; tarsus 0·65; middle toe 0·6, claw (straight) 0·2; bill to gape 0·42, height at nostril 0·3.
"Iris brown; bill and feet plumbeous" (*Jerdon*).
Entire head, neck, and upper chest jet-black; rest of body and wings dark chestnut, changing abruptly into dull black on the centre of the lower breast, abdomen, and under tail-coverts, and blending into the dark maroon of the upper tail-coverts; tail chestnut-brown, the feathers margined near the tips with paler maroon than the coverts.
This species differs from *M. malacca* merely in the chestnut colouring of the under surface, having the head, neck, and black lower-surface patch the same.

Young (N.W. Himalayas: Pinwell). Above brown, tinged with rufous on the back and rump; the throat white; chest and flanks rufescent fulvous, paling on the centre of the breast; thighs brownish rufous.

Obs. Doubts exist whether Vieillot's name *atricapilla* (Ois. Chant. 84, pl. 53) applies to this bird or not. I retain Hodgson's name, however, as the species only takes a doubtful place among the ornis of Ceylon.

Distribution.—Layard remarks (*loc. cit.*) that he found this Munia about Galle; but as it has never since been seen in Ceylon, and is a bird which does not strictly belong to the south of India, its presence in the Galle district must have

Female. Somewhat less than male ; wing 2·1.

Iris brown, in some slightly reddish; bill light leaden or milky blue; legs and feet sombre blue, or dark slate-blue, or pale plumbeous.

Entire head and neck, chest, lower breast, abdomen, thighs, and under tail-coverts *glossy* black ; chest, upper part of breast, and flanks white, its junction with the black of the throat and of the belly being convex in shape; back, scapulars, and wing-coverts chestnut-brown; quills brown, edged with chestnut; upper tail-coverts glistening deep maroon, central rectrices rich glistening chestnut; the remaining feathers, which are darker brown than the wings, edged with the same. In abraded plumage the colours of the upper surface fade much.

Young. Iris deep brown; bill brownish horn or dusky plumbeous; legs bluish brown, in nestlings lilac-grey.

Uniform pale rufescent brown above, darker somewhat on the head, some specimens having the forehead and lores darker still; quills dark brown, edged with the hue of the back; under surface pale fulvous-white, lightest on the breast. During the change to the adult dress, which takes place by a moult in the first year, individuals in every variety of plumage may be seen. The nape and hind neck change first to black, and then the lower parts; the maroon rump is last acquired, as I have obtained specimens in almost complete black and chestnut plumage with the grey rump still unchanged.

Obs. Indian specimens correspond very well with ours; two examples in the national collection are somewhat pale on the back, in spite of being in good plumage. They measure 2·18 inches in the wing; another is larger—wing 2·2 inches, tail 1·7, height of bill at nostril 0·34, these measurements being precisely those of Ceylonese birds.

It is considered by some that Linnæus's name does not safely apply to the present species, owing partly to his somewhat meagre description, and also to the distribution assigned by him to the species. As regards his description, he leaves out all mention of the white underparts: "ferruginea, capite abdomineque nigris, rostro cæruleo" is all that we have. He refers to Edwards's plate, 'Gleanings,' 355, which gives a representation of a bird which cannot be any other species, and which is called by Edwards "the White-breasted Indian Sparrow." It was figured from a specimen kept in confinement in St. Clement's. Reference is likewise made to Brisson's description of the "Chinese Sparrow," in which mention is made of the white underparts and black belly; but the distribution

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been owing to a flock having been let loose from a ship calling at the port. By such means, or by pairs escaping from confinement, the little Amaduvad became not uncommon during several years of my residence at Colombo: I am not sure that it bred there; but it would appear that the present species, if rightly identified, did *not* propagate itself in the south of Ceylon, or else it would have been met with subsequently.

It replaces the White-bellied Munia in the north of India, being, according to Jerdon, "found throughout Lower Bengal, and all along the foot of the Himalayas, as far as the Dehra Doon, and also in some of the wooded adjacent districts; but it would appear to be rare in the open country of the N.W. Provinces. I have," he remarks, "seen specimens from the eastern coast north of Madras . . . . but it is certainly rare in Southern India. It is much more common in the countries to the eastward, Assam and Burmah, as far as the Tenasserim provinces." I do not find any other record of its occurrence in the south, or, in fact, any lower down the peninsula than Sambalpur. Mr. Cripps says it is nowhere common in Furreedpore; in North-eastern India it is, according to Mr. Inglis, common during the rains, breeding there in June, July, and August; in Upper Pegu Mr. Oates records it as likewise common; but to Tenasserim it is only a summer visitant, Mr. Davison having observed it there from March until August. If identical with Vieillot's bird, it is found at Singapore and at Sarawak and Labuan (*Salvadori*).

In its *habits* and voice, Mr. Davison remarks, "they resemble other Munias, going about in larger or smaller flocks, and feeding on the ground, chiefly on grass-seeds." Mr. Oates says it affects elephant-grass and swampy places in preference to others.

Nidification.—The breeding-season of this handsome Munia in Bengal, Burmah, and Cachar is from June until September; but in Tenasserim, further south, Mr. Davison speaks of their laying in April and May. In Pegu Mr. Oates says it breeds in elephant-grass, attaching its nest to two or three stems at a height of four or five feet from the ground. It is "a loose mass of grass, spherical, cylindrical, or heart-shaped; the inside is lined with finer grass, the following ends being brought forward to the entrance, which is small and difficult to find." In 1874 Mr. C. Parker found it nesting in long grass near the top, the nest being a very conspicuous object; but in the following year, owing to the grass having been cut down, they selected prickly date-palms and small pines to build in. The eggs vary from two to five in number, and are elongated glossless ovals, from 0·58 to 0·68 inch in length, by 0·4 to 0·47 inch in breadth.

("China and Java") does not accord with that of our bird. It was from this that Linnæus took his distribution, as Edwards does not give any; and it is probable that Brisson took his idea from information received from sailors and travellers, in those days a not very reliable source. We find no mention of this species in China made either by Swinhoe or Père David; and Raffles merely gives the name in his Catalogue of Sumatran birds (Trans. Linn. Soc. xiii. p. 313), without any note whatever, so that his identification might have been incorrect. Blyth stated that "the true *Munia malacca* from Borneo (in Mr. Wallace's collection) is distinct from the Indian race" (Ibis, 1867, p. 40). I have carefully looked over the museum collection with Mr. Sharpe, and I find no such skin of Wallace's: and I think it is best to rely on the evidence given by Edwards's plate, and leave the long-adopted nomenclature of the species undisturbed. Salvadori includes it in his Bornean list of birds on the authority of others, but is himself under the impression that *M. atricapilla* has been mistaken for it.

Distribution.—This fine Munia is common in the south of the island, particularly in the district lying between the Bentota river, round the south-west coast to the Wallaway river. Between Galle and the Kukkul Korale forests it is found in wild paddy-fields and small cultivated tracts of land near the inland villages in that wooded region. I met with it close to the sea between Tangalla and Hambantota, but did not see it in the coast-district east of the latter place. It reappears in the Park country, and is not uncommon between Batticaloa and Madulsima; it ascends into the hills between Bibile and Badulla, and inhabits all that region and the Uva patna-basin in considerable numbers, luxuriating in the long grass and tangled vegetation which clothe the maze of hills between Udu Pusselawa and Haputale. In the western parts of the Kandy country it is far less common. It does not seem to be common in the Western Province, except in certain localities, such as the sylvan paddy-fields in the lower part of the Pasdun Korale; there I found it plentiful not far from Agalewatta. It inhabits the east coast from Batticaloa northward as far as Trincomalie and the neighbourhood; but further north it appears to be rare.

On the mainland it has a restricted range, being chiefly confined to the south of the peninsula, "a few stragglers," according to Jerdon, "occurring in Central India, and even in Bengal occasionally." He remarks that it is very abundant in some parts of Southern India, especially on the Malabar coast. I do not find it recorded by Mr. Bourdillon from the Travancore hills, nor from the Palanis by Dr. Fairbank. Mr. A. G. Theobald found it in the Coimbatore district. Mr. Hume includes it in Mr. Ball's list of birds inhabiting the region between the Ganges and the Godaveri, noting it as having been procured at Raipur. In the Bhundara district it was found nesting by Mr. Blewitt.

Habits.—The "Chestnut-backed Finch" affects paddy- and grass-fields, situated among the woods and forests, and is also found in marshy land about tanks and water-holes. In the hills it is partial to the maana-grass patnas, and those covered with tangled bushes and rank vegetation. It is very destructive in the paddy-fields of the Kandyans, necessitating the constant presence of call-boys, and the erection of all manner of scarecrows, for the protection of their crops. Like the two following species it is very sociable, feeding in large flocks, which are quite sufficient to inflict heavy damage in the fields of the hard-working Cingalese cultivator. It is very fond of the seed of the maana-grass, and that of various reeds and rushes which grow in swamps and marshy spots. Its note is like that of the common species *M. punctulata*, but stronger, and its flight is also similar. Jerdon writes of this species:—"It frequents long grass by the sides of rivers and tanks, occasionally dry grain-fields, and very commonly sugar-cane fields; it often associates in very large flocks."

Nidification.—This Munia breeds often gregariously. The season of its nesting lasts from May until August. In the former month I found many nests among the gigantic "maana"-grass and tangled "brackens" which cover the Uva patnas; and in the latter I found it nesting, *a number together*, among reeds near Hambantota, in company with the Baya (*Ploceus manyar*?). The nest is sometimes placed in a low bush; but it is more frequently built in grass and "brackens." It is a large, strongly made, globular structure, composed of the material nearest to hand, either blades of grass and roots, or strips of reeds, with a large unfinished-looking opening at the side. The interior is roomy, and in some cases very deep, and is lined with flowering grass-stalks or fine grass itself. The eggs vary from four to six in number, but most commonly do not exceed

the former figure; they are pure white, rather stumpy ovals, and larger than those of its congeners. I have found them to vary from 0·73 to 0·63 inch in length, and from 0·45 to 0·5 inch in breadth.

In India it breeds from July till October.

Mr. Theobald writes of its nesting as follows:—"I found the nests near Pothanore, in the Coimbatore district, during the latter half of October. They were placed amongst reeds growing in a small pond; they were round, with a round hole on one side for an entrance, and were composed of dry seeds and leaves of some flag-leaved grass very like the Cholium (*Sorghum vulgare*). The lining was composed of the hair-like filaments from the broom-grass of this country. Seven, I think, is the full complement of eggs." Mr. Hume gives the average size as 0·64 by 0·47 inch.

MUNIA PUNCTULATA.

(THE SPOTTED MUNIA.)

Loxia punctulata, Linn. Syst. Nat. i. p. 302 (1766).

Loxia undulata, Lath. Ind. Orn. i. p. 387 (1790).

Munia undulata (Lath.), Blyth, Cat. B. Mus. A. S. B. p. 117 (1849); Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 506 (1854); Jerdon, B. of Ind. ii. p. 354 (1863); Holdsworth, P. Z. S. 1872, p. 464; Legge, Ibis, 1875, p. 275.

Amadina undulata (Lath.), Kelaart, Prodromus, Cat. B. p. 125 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 258.

Lonchura punctulata (L.), Adam, Str. Feath. 1873, p. 387; Ball, ibid. 1874, p. 420; Butler & Hume, ibid. 1875, p. 495.

Munia punctulata, Hume, Nests and Eggs, ii. p. 444 (1874); Fairbank, Str. Feath. 1876, p. 260, et 1877, p. 408; Davidson & Wender, ibid. 1878, vol. vii. p. 85; Ball, *t. c.* p. 222; Cripps, *t. c.* p. 293.

Cowry Grosbeak, Edwards, Birds, pl. 40; *The Reddish Indian Finch*, Kelaart; *The Barred Munia* of some. *Telia Munia*, Hind. in North; *Sing-bay*, Hind., Deccan and Mussoori; *Shubz Munia*, Bengal.; *Kakkara jinuwayi*, Telugu (Jerdon).

Wé-kurulla, Sinhalese; *Tinna kuruvi*, Tamils; *Pastro de Neli*, Portuguese in Ceylon.

Adult male and female. Length 5·1 inches; wing 2·1 to 2·25; tail 1·75; tarsus 0·6; middle toe and claw 0·75; bill at front 0·45.

Individuals vary in size, and I think females generally average smaller than males.

Iris light red; bill variable according to age, slate-colour or blackish leaden, in some brownish, the lower mandible paler at the base; legs and feet bluish or plumbeous.

Head, upper surface, sides of neck, and lower part of throat chestnut-brown, blending into the rich deep chestnut of the throat and face.

Above the feathers have narrow light striæ, which extend to the upper tertials; wings brown, edged with chestnut; upper tail-coverts, margins of tail-feathers, and tips of those on the rump ochre-yellow, more or less glistening; some of the feathers of the latter have indistinct brownish bars and whitish striæ; beneath from the chest white, with wavy edges and cross bars of blackish brown on the upper breast and sides, darkest and most conspicuous on the flanks; under tail-coverts unspotted white.

Young. Above pale earthy brown, darker on the head; secondaries edged with fulvous; upper tail-coverts tinged with obscure yellowish; beneath pale sullied buff, albescent on the lower parts.

Birds acquiring the adult plumage have the upper part of the breast without the cross bars, the feathers being merely subedged with brown; the tertials tipped with white with a dark edge.

The young of this species, of *M. malacca*, and *M. rubronigra* are very similar; the dark thighs in the latter lead to a speedy recognition, while the yellowish upper tail-coverts in the present species distinguish it from *M. malacca*, in which these parts are rufescent.

Obs. Five examples from the Himalayan district (Darjiling to North-west Himalayas) measure in length of wing from 2·1 to 2·2 inches; one from the peninsula and another from Mysore both 2·15; all agree in character of coloration and size of bill with Ceylonese examples.

The Spotted Munia of Tenasserim differs slightly from the present species, and has been separated by Mr. Hume as *M. superstriata*; it has "the feathers of the head, neck, mantle, and rump with conspicuous pale shafts; the rump is greyer . . . . . and the tail-feathers and upper tail-coverts are fringed with an olive-yellow and not the golden-yellow" of continental specimens.

A closely allied race exists in *M. punctularia* from Malacca and the Malayan archipelago, which merely differs in having the upper tail-coverts greyish brown, the longer feathers being tinged with obscure yellowish; and the tail darker brown, with the central feathers tinged with greyish. It is slightly shorter in the wing—specimens from Bali, Timor, Makassar, and Malacca varying from 2·0 to 2·1 inches; the lunulations of the under surface have a reddish tinge as distinguished from the almost pure black in the generality of specimens of *M. punctulata*. An example from Nepal and another from Behar have the under-surface markings on the breast quite rufous.

Distribution.—The Spotted "Finch" is the most numerous of the family of Munias inhabiting Ceylon. It is abundant both in the north and south of the island and on the east and west coasts, frequenting the sea-board as much as the interior. In the Kandyan country it is common up to elevations of 2500 feet in open localities; and in Uva, where patna-land is so widespread, it is found nearly up to 4000 feet. I have met with it at this altitude in the Badulla and Madulsima districts, and I doubt not that it possibly ranges still higher between the former place and Hakgala, in which neighbourhood not a few low-country birds are found during the N.E. monsoon. In the west and south of the island it far outnumbers its congeners wherever the country is open or cultivated, but is not so plentiful in jungle-districts as the next species.

It is well known to the inhabitants of Colombo, who have frequent occasion of observing it in their afternoon drives round the ornamental "circular" in the cinnamon-gardens.

In India it is very abundant, inhabiting the peninsula throughout in suitable localities, and ranging more towards the east of the continental portion of the empire than the west. Jerdon says that it is rare in the extreme south; and I notice that Dr. Fairbank only observed it twice in thin jungle on the lower Palani hills. They are migratory to the Nilghiris, appearing there, according to Miss Cockburn, from June till October. It is singular that this species should be so common in Ceylon when it is not abundant on the adjoining mainland. Mr. Hume, generalizing, says that it only breeds, as a rule, in well-wooded and well-watered tracts; but, notwithstanding, Jerdon affirms that it does not occur on the Malabar coast, although he found it in various parts of the Carnatic and Central India. In the Ahmednugur district it is rare according to Dr. Fairbank, but in parts of the Deccan it is common and breeds (*Davidson and Wender*). From the extended eastern region lying between the Mahanadi and Ganges rivers Mr. Ball records it as occurring on the Rajmehal hills, and in the Manbhum, Lowardugga, and Singhbhum districts of Chota Nagpur; also in Sambalpur, Raipur, and the Godaveri valley. Mr. Cripps states that in Furreedpore, Eastern Bengal, it is nowhere common; but during the rainy season a few pairs are seen about hedgerows and cultivated fields, and they breed in the district from June to August. Further to the north-east it becomes scarce. Captain Beavan observed it at Barrackpore; but beyond this I cannot find any certain evidence of the existence of true *punctulata*. Mr. Inglis did not meet with it in North-eastern Cachar, and beyond this another allied species exists in the *M. subundulata* of Godwin-Austen. Mr. Hume, in commenting on Mr. Oates's notes on this species in Pegu, which was said by him to be by far the commonest Munia there, says that the specimens were destroyed; and we have not since been informed whether the species inhabiting that province really is the same as the continental Indian bird or identical with the Tenasserim allied race, *M. superstriata*, Hume. Returning towards the west we find that at Mount Aboo it is, according to Captain Butler, common, associating in large flocks in the hot weather and breeding in September; but Mr. Hume adds that it occurs in no other part of the whole region (Sindh, Cutch, Kattiawar, and Jodhpoor), although Mr. Adam saw it once in the rainy season at the Sambhur Lake.

From Lower Bengal it extends to the sub-Himalayan district, and appears to be found throughout it from Darjiling to the North-west Himalayas, whence there are specimens in the British Museum.

Habits.—This sociable little Munia chiefly frequents open land, grass- and pasture-fields, gardens and compounds around native villages, paddy-fields, and patna-hills in the Central Province. It consorts in large flocks and is almost entirely terrestrial in its habits, feeding in close contact on the ground, and tripping nimbly about among the grass. It is very destructive to the paddy, alighting on the stalk and picking out the grain, in spite of the shouts of watch-boys, the outstretched arms of the many uncouth scarecrows, and loud knockings of the ingenious bamboo "clappers," devised by the natives for the protection of their crops. It is at all times very tame, showing no fear of man, and when raised from the ground by his approach flies for a short distance and settles down again. Its ordinary note is a plaintive whistle, and this is often

accompanied by a little dissyllabic chirp. It roosts in companies among the branches of shrubs and low trees, the lime and orange being favourite resorts. The males are pugnacious in the breeding-season, and may often be found with the face and forehead denuded of part of the feathers from the pecking of antagonistic bills. Layard, in his notes on Ceylon birds (Ann. & Mag. Nat. Hist. 1854, xiii.), says that the natives fatten these Finches, to be used as medicine in pulmonary complaints. They are caught by them, in common with other birds, by the much-adopted horsehair noose.

Nidification.—These birds breed pretty well all the year round, but the favourite season is perhaps from April to July. The nest is built in any umbrageous shrub or tree, at a height varying from 5 to 30 feet from the ground, but for the most part at about 10 feet, and is a massive untidy structure of any shape that its situation may require to give it due support; some are globular, others oval, with the longer axis horizontal or vertical, as the case may be, while many are without any shape whatever; the materials used are grass-stalks and blades, straw, or strips of cane or palm-leaves; the egg-cavity is very large and sometimes lined with feathers, but oftener with fine grass. Several nests are often placed in the same tree, and frequently there are two compartments in the same structure; but, to my knowledge, they are never both occupied, the second being merely the new nest *added* to an old one, instead of the latter being repaired, which is very often the case.

Some large nests frequently measure more than a foot in diameter, the diligent little architects constructing them in a few days, working without cessation, and flying about with immense straws or grass-stalks in their bills streaming after them in the air. The eggs are from four to six in number, ovals in shape, and pure white, with a considerable gloss on the shell. They measure on the average about 0·66 by 0·46 inch.

Layard speaks of thirty or forty nests being placed in one tree. I have never seen more than half a dozen at the most.

From perusing Mr. Hume's 'Nests and Eggs' we gather that in most parts of India the Spotted Munia breeds in July and August, but in the Nilghiris from February to September. The nests are built, as in Ceylon, from 5 to 12 feet from the ground, and seven is the normal number of eggs. A notice of this bird's nesting would be incomplete without my subjoining the following charming account, written by Miss Cockburn, from the Nilghiris. She remarks:—"I have watched with great interest the punctual return year after year of these pretty friendly little birds, and have very carefully noted their behaviour and habits. In selecting a place to build on they sit on a twig, and raising themselves as high as possible flap their wings over their backs to ascertain that no small branches are likely to obstruct the progress of their building, thus appearing to be fully aware that their nest will occupy a good deal of space. When perfectly satisfied as to the convenience of the spot, the female remains there while the male flies to a short distance, alights on the ground, and breaking off a piece of fine long grass, flies back with it to the female and continues to bring her at least one piece every minute, while she carries on the building process alone. They begin early and build for an hour or so, then leave off till evening and work late, keeping up an incessant cry of '*kitty, kitty, kitty.*'

"The nest is composed entirely of grass; the entrance is at one side, a small round hole, so small that two fingers can hardly be inserted. They build in July and August, and lay from six to ten white eggs, so beautifully translucent that the yolk is clearly seen through the shell. When the young are fully fledged they accompany their parents to the grass-fields, but continue to return to their nests every evening for a long time after they have left them during the day. How they all manage to get in is wonderful. The nest appears perfectly full, and they seem to be restless and uncomfortable for some minutes after entering. In the morning they fly out one by one; those that go first wait for the others on some bush close by. When all are out away they fly in a flock, and are not visible near their nest during the rest of the day. At one time I counted no less than fourteen nests of these birds in the trellis of our 'verandah' and windows..... I have known instances of the House-Sparrow taking possession of the Spotted Munia's nest. They wait till the latter have finished building and then (being much bolder birds) drive the poor Munia away, and adding to the warmth of the nest by a number of feathers, appropriate it to their own use. On one occasion a pair of these Munias had taken a fancy to the trellis at my window. When their nest was completed an impertinent cock Sparrow seemed determined to take possession of it; but I was equally determined he should not. After a good deal

of trouble the poor owners were again the proprietors of their lawful abode. They appeared to be quite aware that I was taking their part in the arbitration business, and would sit patiently on a Fuchsia-bush close by till the case was decided. Sometimes one of their own species would approach their building; but at these times I considered them quite able to fight their own battles, and merely looked on. They required no assistance, but would sit close to their nest cracking their mandibles to show how decidedly displeased they were. This proceeding used often to have the effect of inducing their unwelcome visitor to take his departure; but if he did not think of going soon they would fly at him and use their bills to such purpose as to make him glad to be off.

"Yet notwithstanding that these little birds are so tenacious of their rights when invaded by one of their own species, they are easily intimidated by any strange and unexpected object. A few articles of furniture being placed under the trellis, which contained several of their nests, so completely frightened the parents away at one time that they left their helpless brood without food, and would not return even when the objects of offence were removed. Of course the young receiving no nourishment all day became fainter and fainter in their cries for food, and at last died."

MUNIA STRIATA.

(THE WHITE-BACKED MUNIA.)

Loxia striata, Linn. Syst. Nat. i. p. 306; Walden, Ibis, 1874, p. 144.

Amadina striata, Blyth, J. A. S. B. 1844, xiii. p. 349; Kelaart, Prodromus, Cat. p. 126 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 258.

Munia striata, Blyth, Cat. B. Mus. A. S. B. p. 117 (1849); Jerdon, B. of Ind. ii. p. 356 (1863); Holdsw. P. Z. S. 1872, p. 464; Hume, Nests and Eggs, ii. p. 448 (1874); Fairbank, Str. Feath. 1876, p. 260; Ball, ibid. 1878, vii. p. 222.

Striated Grosbeak, Latham; *The Striated Munia*, *Striated Finch* of some; *Striped Paddy-bird*, Europeans in Ceylon, also *Ortolan*. *Shakari munia*, Bengal. (Blyth).

Wé-kurulla, Sinhalese; *Tinna kuruvi*, Ceylonese Tamils; *Pastro de Neli*, Portuguese in Ceylon.

Adult male and female. Length 4·5 to 4·7 inches; wing 2·05 to 2·15; tail 1·6 to 1·8, centre feathers 0·4 longer than the lateral pair; tarsus 0·5; middle toe and claw 0·6 to 0·63; bill to gape 0·4 to 0·45, height at nostril 0·33. Females are the smaller of the sexes.

Iris brown or reddish brown in some; bill and upper mandible blackish leaden, lower mandible bluish, with dark tip; legs and feet bluish or dusky leaden.

Forehead, face, fore neck, and chest dull black, paling gradually at the crown into the sepia-brown of the hind neck, back, and scapulars; upper tail-coverts darker brown than the back; feathers of the crown, hind neck, back, scapulars, secondary wing-coverts, and upper tail-coverts with whitish shafts; wings blackish brown, the quills with inner basal edges of rufescent fawn: lower back and rump forming a band of less than $\frac{1}{2}$ an inch in width, white, some of the feathers generally with brownish tippings or cross marks; tail brownish black; under surface with the flanks, from the chest to the vent, unmarked white; lower flank-feathers covering the thighs sepia-brown, with whitish shafts; under tail-coverts brownish black, with rusty tips; thighs dark brown; under wing-coverts pale fawn-colour.

Some examples have not the black chest clearly defined against the white breast, the feathers at the top of the latter being patched with blackish: again, others are much paler brown above; these are probably birds in the first stage of the adult dress.

Young? An example shot in July (Galle) has the wing 2·0; bill blackish; legs and feet lilac-grey.

Head and occiput dark brown, changing into brownish rufous on the back, scapulars, and wing-coverts; wings and tail brown, edged with rufous-brown; beneath rufescent white, strongly tinged with rufous on the chest.

N.B. This is only the presumed young of this species. I shot the specimen out of a flock of three; from its smaller size and more diminutive bill than those of the last species I take it to be *M. striata.* I am not sure of it, as subsequently I omitted to place the matter beyond doubt, and I have not met with a description of the young in any Indian work. I bring this subject especially to the notice of my readers, as young birds must be common enough.

Obs. A "Malabar" specimen in my collection corresponds well with dark examples from Ceylon. Wing 2·05 inches; tail 1·8.

There are several remarkably closely allied Asiatic species to the present, which form a "well-defined subgroup of the genus *Munia*" (Walden). Lord Tweeddale, in his valuable paper on an Andaman collection (Ibis, 1874, p. 144), gives the following useful diagnosis of these Munias:—

"*Uropygium white.*—*M. striata.* Dorsal plumage pale-shafted; *abdominal* region and flanks pure white.

"*M. acuticauda*, Hodgson. Abdominal plumage white, faintly marked with pale brown; middle rectrices elongated.

"*M. fumigata*, Walden (Andamans). Dorsal plumage unstriated."

(To these may be added *M. semistriata*, Hume, Str. Feath. 1874, p. 257 (Nicobars): smaller than the last, with proportionately longer tail, a faint trace of striæ on the back, feathers of the breast narrowly margined with pale rufous-brown.)

"*Uropygium uniform with the back.*—*M. leucogastra*, Blyth (Malacca). Dorsal plumage pale-shafted; flanks dark brown; middle rectrices lustrous yellow.

" *M. leucogastroides*, Moore (Java). Dorsal plumage unstriated; all the rectrices black; flanks white."

M. acuticauda, which ranges from the mountains of Northern India, through Burmah, Malacca, to China and Formosa, has also the brown of the chest paler than in *striata* and with pale shaft-stripes. The upper plumage is likewise rather pale compared with that of the latter. The examples I have inspected vary in the wing from 1·95 to 2·0 inches. A specimen of *M. leucogastra* measures 1·9 inch in the wing.

Distribution.—The White-backed or Striated "Paddy-bird" is, next to *M. punctulata*, the commonest of the genus in the Western and Southern provinces, and in those parts frequents the interior more than the sea-board. It is, however, seattered more or less over all the low country, being found throughout most of the north of the island, where it is chiefly numerous on the sea-coast. It is found in the Central Province, in all the western parts, including the Kandy country, up to about 2500 feet, and in Uva is common up to 4000 feet, being, in company with *M. malacca*, more frequent on the patnas round Badulla than the Hill-Munia.

On the mainland, as far as India proper is concerned, it seems to be restricted to the peninsula and lower Bengal, but it is said likewise to be found in Arrakan (*Jerdon, Hume*). It is evidently a locally-stationed species. In the 'Birds of India,' Jerdon writes that it is most abundant on the Malabar coast, and occurs sparingly in other parts of India, in the Northern Circars, and in Lower Bengal. The Rev. Dr. Fairbank records it from "Khandala to Goa, along the Ghât hills;" but Messrs. Davidson and Wender do not include it in their avifauna of the Deccan. Mr. Aitken met with it in Bombay. On the eastern side of the peninsula we find Mr. Ball noting it from Manbhum, Singhbhum, and Raipur; and Mr. Hume from Sambalpur, north and south of the Mahanadi river. It is said to visit, but not to be resident on, the Nilghiris.

Habits.—This "Finch" does not associate in such flocks as the spotted species, but is met with chiefly in small parties of less than a dozen, frequenting waste, scrubby land, clearings in the jungle overgrown with bushes, long grass, and very often wild jungle and forest, in the very heart of which I have seen it; in its nature, therefore, it assimilates to the Ceylon Hill-Munia. When the "paddy" is in ear it resorts to the fields and devours the ripening grain after the manner of its congeners, and when driven off by the watch-boys, alights on the tops of adjacent bushes, and waits its opportunity to return to the attack. It is fond of the Kurrukan (*Eleusine indica*), which, being grown in clearings in the jungle, is never free from its foragings; it likewise feeds on the berry of the *Lantana* and other plants. Its flight is feeble and straight, being performed with regular beatings of the wing, and is accompanied by its plaintive chirrup note.

I glean but little concerning its economy from Indian writings. Jerdon remarks that it is a familiar bird in Malabar, "being constantly seen on the road-side, about houses, and in stable-yards, and it builds in gardens and orchards." Miss Cockburn's experience of it in the Nilghiris is contrary to this. She writes, "The White-backed Munia is not a resident on the Nilghiris, but accompanies the Amaduvads and Spotted Munias in their migrations, and is generally met with in their society, except in the breeding-season, when they are seen alone and in pairs. They are not numerous, and are very shy, never approaching any house. In this respect they are quite unlike the Spotted Munia, whose unceremoniousness endears him to us."

Nidification.—The breeding-season in the north and south is, for the most part, from May until August; but, like all these birds, it appears to be constantly nesting, most probably rearing two broods in the year. The nest is built in the fork of a shrub or among the small branches of low trees, from 3 to 10 feet from the ground generally; it is a loosely-made untidy structure of grass, in the form of a large ball, with the entrance at the side; the egg-cavity is large and destitute of any lining, save that furnished by the materials of the body of the nest. In shape the eggs are ovate, pure white and tolerably glossy, smaller than those of *M. punctulata*, some measuring as little as 0·5 inch in length by 0·4 in breadth; they vary, however, up to 0·65 by 0·45.

As regards India, Mr. Hume remarks that the breeding-season varies according to locality; "in the Nilghiris they appear," he says, "to lay in July and August. From Yercaud a nest was sent to me, taken on the 28th of September, containing six eggs. . . . . . Near Raipoor nests were taken in January, and in Manbhoom in April." The nest is described by various observers as large, and loosely constructed of fine and coarse grasses, which, in one that Mr. Blewitt writes about, was intermixed with dry bamboo-leaves. The average size of ten Indian eggs is 0·61 by 0·44 inch.

MUNIA MALABARICA.

(THE PLAIN BROWN MUNIA.)

Loxia malabarica, Linn. Syst. Nat. i. p. 305 (1766).

Munia malabarica, Blyth, Cat. B. Mus. A. S. B. p. 117 (1849); Jerdon, B. of Ind. ii. p. 357 (1863); Holdsw. P. Z. S. 1872, p. 464; Hume, Str. Feath. 1873, p. 209; Adam, *t. c.* p. 387; Legge, Ibis, 1874, p. 25; Butler & Hume, Str. Feath. 1875, p. 496; Fairbank, ibid. 1876, p. 261; Ball, ibid. 1878, vii. p. 222; Cripps, *t. c.* p. 293.

Amadina malabarica, Kelaart, Prodromus, Cat. p. 125 (1854); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 258.

Malabar Grosbeak, Latham; *Malabar Finch*, Kelaart; *Pin-tailed Munia*, *The Pin-tailed Finch* of some in India. *Charchara*, Hind., N.W. Prov.; *Chorga*, Hind. in North; *Piddari*, Hind. in South and Central India; *Sar-munia*, Bengal.; *Jinuwayi*, Telugu.

Adult male. Length 4·9 inches; wing 2·1 to 2·2; tail 2·0; tarsus 0·55; middle toe and claw 0·6; bill at front 0·37; central rectrices in fine specimens 0·25 inch longer than the next pair.

Female. Somewhat smaller; wing 2·05 inches; tail 1·7.

Iris brown; bill, upper mandible dusky leaden, lower bluish; legs and feet lilac or mauve in some.

Above pale earth-brown, darkest on the head; wings and tail deep brown, the dark colour on the wing confined to the

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Genus ESTRELDA.

Bill smaller, more compressed towards the point, and more flattened at the base than in *Munia*; tarsus slenderer and proportionately longer; hind claw long. Of smaller size than *Munia*; bill red. The male acquiring a breeding-plumage in some species.

ESTRELDA AMANDAVA.

(THE RED WAXBILL.)

Fringilla amandava, Linn. Syst. Nat. i. p. 319 (1766).

Estrelda amandava, Jerdon, Cat. B. S. India, Madr. Journ. 1839, xi. p. 26; Blyth, Cat. B. Mus. A. S. B. p. 118 (1849); Jerdon, B. of Ind. ii. p. 359 (1863); Legge, J. A. S. (Ceylon Branch), 1870–71, p. 53 (first record from Ceylon); Holdsw. P. Z. S. 1872, p. 464; Hume, Nests and Eggs, ii. p. 454 (1874); Legge, Ibis, 1874, p. 25; Butler & Hume, Str. Feath. 1875, p. 496.

Amaduvad Finch, Edwards, Birds, pl. 355. fig. 1.

Amaduvad, Europeans in India. *Lal* (male), *Munia* (female), but usually *Lal-munia*, Hind.; *Yerra jinuwayi*, Telugu.

Adult male (Colombo, June). Length 4·1 inches; wing 1·6; tail 1·7; tarsus 0·5; middle toe and claw 0·62; bill at front 0·4.

Iris vermilion, blackish at the base of upper mandible; legs and feet fleshy reddish grey.

Breeding-plumage. Head, upper tail-coverts, throat, chest, and breast crimson, changing on the hind neck and back into brownish crimson, the bases of the feathers very brown and the tips crimson; upper tail-coverts with terminal white spots, preceded by a dark edge; wing-coverts and tertials with a round terminal spot of white on each feather; lores black; orbital fringe white; breast and flanks white-spotted, with the wing-coverts, lower breast,

outer web; rump and upper tail-coverts white, the bases of the feathers brown, and the outer webs of the longer coverts blackish brown; a narrow supercilium, face, ear-coverts, and all beneath white, shaded on the flanks with brownish grey or fawn-colour.

In some examples the lower flanks are *very* faintly barred with pale fawn-colour; some are darker than others above.

Obs. Some Indian examples show a greater tendency to barring on the flanks; notably one from Behar. As regards size: a skin from Madras measures 2·15 inches; another from N.W. Himalayas 2·2; one from Behar 2·1, tail 1·9 (this example is darker on the head than my birds; the two others are very pale on the back). Mr. Cripps, in his paper on the avifauna of Furreedpore, gives the following measurements:— ♂, length 4·83 inches; expanse 6·8; wing 2·1; tail from vent 1·92; tarsus 0·56; bill from gape 0·42; weight 0·66 oz. The specimen from N.W. Himalayas, collected by Capt. Pinwell, has the fulvous of the lower flanks quite unmarked.

Distribution.—This is essentially a bird of the dry climate of Ceylon; wherever the little Finch-Lark (*Pyrrhulauda grisea*) is to be found the Plain Brown Munia is likely to be met with. Its distribution is therefore local, and it is chiefly confined to open districts in the maritime regions of the north, east, and south-east. It is found around the west coast as far as the Chilaw district; but south of this place, where the heavier rainfall line is passed, its range does not extend; and I have never seen it anywhere between that point and Tangalla: here the dry coast-region is again entered upon, and it becomes tolerably common. I have met with it in various parts of the eastern side, and at Trincomalie it is not uncommon. It is numerous, according to Mr. Holdsworth, at Aripu; and I have seen it there and at Manaar and further up the coast, while at Jaffna and the islands it is common. In the interior of the northern forest tract it may be met with in suitable localities; but I do not know that it extends into the hills at all.

In India it is a bird of wide distribution both in the peninsula and in the northern parts, being abundant in the hot dry regions of the west, but not extending to the eastward of the Bay of Bengal. According to Jerdon,

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flanks, and under tail-coverts black, washed, except on the latter, with crimson; tail black, the two outer feathers on each side tipped white.

After the breeding-season the male assumes the plumage of the female.

An example shot in *January* at Colombo has the forehead and supercilia red, and the feathers of the hind neck and back tipped with crimson; upper tail-coverts crimson, some of the feathers with small white spots; chest and throat crimson, mingled with partially white feathers, and the breast blackish, washed with crimson, and barred and otherwise marked with white; the flanks and sides of breast spotted with white.

Another, probably a *bird of the year*, has the supercilia and upper tail-coverts as the above, but the lower back and hind neck uniform olive-brown; the under surface chiefly white; the feathers of the fore neck in various stages of change to red, those of the breast turning black; the under tail-covert feathers changing from white to black.

Both these examples are assuming the breeding-dress by a *change of feather*, and *not by a moult*. Jerdon remarks that this species *moults* twice a year.

Female. Similar in size to the male.

Brown above, the orbital fringe white, as in the male, and the lores black; the rump and upper tail-coverts washed with crimson; beneath brownish, tinged with fulvous yellow on the lower parts.

Young. "Brown above, paler beneath, whitish on the throat and belly; tail blackish, and a few small white spots on the wings" (*Jerdon*).

Distribution.—In 1870, when I detected this little bird in the vicinity of Colombo, I was under the impression, as it had not been before noticed in Ceylon, that it owed its visit to the island to the agency of man—in short, that it had been liberated from ships calling at the port. I have since become aware that it wanders about a good deal in India, appearing suddenly in districts, remaining for some time, and then departing; and as it occurs in the south of the peninsula it is possible that it *may* have been driven down to Ceylon by the north-west wind which had been blowing before I first discovered it in January 1870. I have no evidence in support of either theory, and therefore I adopt that which appears

it does not ascend the hills; and I have not observed that it has been found recently in any of the alpine regions treated of in 'Stray Feathers.' In the Deccan, Messrs. Davidson and Wender record it as common; and Dr. Fairbank says it is especially abundant in the Ahmednugur district. It is found throughout the open country in the Carnatic, and I have no doubt it is an inhabitant of the island of Ramisserum. Jerdon remarks that it is rare in Malabar and other wooded districts, and generally so in forest districts. Mr. Ball notes it from the Godaveri valley, Nowagarh, and Karial, Orissa north of Mahanadi, Sambalpur, Bilaspur, Sirguja, Singhbhum, Lohardugga, Hazaribagh, Manbhum, and Bardwan, which localities compose the immense tract, from the Godaveri river to the Ganges, which this gentleman has worked; but in a former paper he remarks that it is not common anywhere in the division of Chota Nagpur. In Furreedpore Mr. Cripps informs us that it is a permanent resident, and common, which, indeed, it appears to be throughout Bengal. Mr. Hume records it from Etawah, Captain Marshall from Allahabad, and Mr. Brooks from the Delhi, Jhansi, and Saugor districts. It must likewise extend to the sub-Himalayan region, as Capt. Pinwell's specimens were procured, as I understand, beneath the N.W. Himalayas. Travelling westward we find that it is common in Sindh, Cutch,

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to me the most tenable, viz., that it had escaped from confinement; and I accordingly do not give it a place in the Ceylonese avifauna as an ordinary straggler to the island. The spot where I met with it was in the Guinea-grass field attached to my quarters on the Galle face: there were about a dozen birds in the flock, and they came daily to the field for about a fortnight; they appeared again the following month (February), and after staying a short time again disappeared. In June following this a male appeared alone; and after I had procured it I saw no more until September, when a pair visited the field again for a day or two. In 1872 I observed one or two close to the Galle Fort, feeding on the esplanade just outside the ramparts.

No other instances of its occurrence are known to me; but it is possible that it may have bred in the island and thus become naturalized, provided that it did not take its own place in our lists. Jerdon thus sketches out its distribution:—"The Amaduvad is found throughout all India, more rare in the south, abundant in the north. In the south of India I have seen it tolerably frequent on the lower hills of the Nilghiris in Mysore, here and there throughout the Carnatic, but rare in the Deccan and the lower tableland generally. It is more common in Central India, and abundant in Oudh and Lower Bengal, extending into the lower ranges of the Himalayas as well as to Assam and Burmah."

It ascends the Nilghiris to an elevation of 6000 feet to breed; near Mahabaleshwar it is rare according to Dr. Fairbank; further north it occurs, as an instance of local distribution, at Mount Aboo, but is not found, writes Mr. Hume, in any part of Cutch, Kattiawar, or Jodhpoor, although it is common in Sindh during the inundation. "In the bare portions of the N.W. Provinces and Rajpootana," he says, "I have never known it as more than a passing visitor; but wherever the country is well watered and either well wooded or abounding in high grass,—in Meerut and the districts of the Doab northwards, in many places in Oudh and Rohilkund, Saugor, Chanda, Raipoor, in the Central Provinces, in the more fertile portions of Sindh, in all our Dhoons and Terais—I know of it nesting." Mr. Cripps once observed it in Furreedpore; and Mr. Ball found it at Manbhum, Sirguja, and Lohardugga. It is a visitor to N.E. Cachar, arriving in October and departing in March (*Inglis*).

Habits.—I noticed that the little flock of Amaduvads which frequented my field were constantly on the move, the restless little birds flying up and settling down continually; they clung actively to the stalks, and reached out their heads, plucking out the seeds of the grass with great avidity. In June the male bird uttered a low sweet little song when perched on the top of a grass-stalk, which scarcely bent its head beneath the tiny weight. They are caught in great numbers in Bengal, and sent abroad to Europe and various parts in the East. Blyth says that the popular name of Amaduvad "took its origin from the city of Ahmedabad, whence it used to be imported into Europe in numbers" (*Jerdon*). In India it is said to affect bushy ground, gardens, and sugar-cane fields, as well as grass; and the male, according to Jerdon, fights with much spirit, being kept for that purpose by the natives.

Nidification.—This little bird has two broods in the year, and breeds in the plains from November till February and from June till August; but in the Nilghiris, writes Mr. Hume, the breeding-season lasts from May till December. The nest is described as an oblate spheroid mass, loosely but not untidily built of fine grass, and lined with fine seed-down; the entrance circular and at one side. Miss Cockburn observes that they are fond of placing their nests at the roots of bushes. The eggs are pointed ovals in shape, pure white, and of course very small, averaging in size only "0·55 to 0·43 inch."

Kattiawar, Guzerat, and Jodhpoor, although it is one of those birds which we miss from Mr. Hume's interesting paper on the birds of the latter region (Str. Feath. 1878, p. 52), it having been evidently driven out of it by the drought of fifteen months which the writer refers to. At the Sambhur Lake it is, according to Mr. Adam, very common.

Habits.—This little Finch frequents bare open commons, barren land surrounding the salt-lagoons and estuaries of the north and east coasts, as also dry pasture-fields and such-like localities in the interior, &c. It feeds entirely on the ground, rarely alighting on trees; and congregating in large flocks, often in company with the Finch-Lark, trips about in closely packed little troops. I have seen it during the harvest-time in paddy-fields with *M. punctulata* and *M. striata* attacking the ripe grain; but its usual food consists of various small grass-seeds. Its note is a strong chirrup and the usual plaintive pipe common to these "Finches." When paired, the sexes demonstrate much affection for each other, as on one occasion after shooting a female example I noticed that its mate flew round and round it in great distress, alighting close to it on the ground and piping out a mournful little whistle. During the rainy weather at Christmas I used often to observe flocks of these Munias on the esplanade at Trincomalie, where also numbers of Pipits, Finch-Larks, and small Shore-Plovers collected to feed. When disturbed the Munias would rise in a dense little pack and fly round and round very swiftly until they realighted not far from where they were put up, when they would move along all in the same direction, picking out the seeds from the short turf-grass.

Jerdon says that this species frequents hedgerows, thickets near cultivation, and groves of trees, often entering gardens, and is met with in the south and in Central India near every village. Mr. Cripps found them in Furreedpore in small parties of five to fifteen in number, frequenting hedgerows and cultivated fields. Col. Sykes likens its cry to *cheet, cheet, cheet.*

Nidification.—This Munia breeds in the north of Ceylon during the cool season from December until March, and builds the usual loose large nest of grass, which appears to vary considerably in size, either having a rather protuberant opening at the top, one in the side of the egg-chamber, or two with a dividing dome or roof between them. It is generally placed in a bush about four or five feet from the ground, and often lined with flowering-stems of grasses.

From Mr. Hume's article on its nesting, contained in his useful work, we glean that this little Finch builds sometimes in various situations, such as a haycock, in the eaves of a verandah, or even in the nest of an Eagle; and Col. Sykes has frequently found them in possession of the deserted nests of the Common Weaver-bird. Mr. Blewitt writes to Mr. Hume concerning a pair which built in the body of a large Buzzard's nest, which was at the time occupied by a Tawny Eagle (*Aquila fulvescens*), and thus describes the circumstance:—"As my man ascended the tree to fetch the Eagle's eggs I saw a pair of the small *M. malabarica* hopping about from branch to branch *near* the nest in great anxiety, chirping loudly all the while. Taking the binoculars to look at the birds and their, as it seemed to me, strange movements more closely, I saw one of them suddenly enter and disappear in a small hole in the underpart of the large nest . . . . Not knowing what the hole could be for, I directed the man to inspect it, when to my astonishment it turned out to be a nest *in* a nest. The Munias evidently selected that of the Eagle to make their own in, to receive warmth from their mighty companion. From the position of the under nest, the Munias at any time when in it could not have been more than two inches separated from the sitting Eagle."

Captain Marshall mentions an instance in which he took some eggs of this bird and four of the Common Sparrow from a nest in his verandah, and suggests that the nest had been probably built by the Sparrow. The eggs vary in number from six to twelve; but sometimes more than one pair lay in the same nest. Theobald, as quoted by Jerdon, found once as many as twenty-five together in different stages of incubation. They are white, like those of other Munias, spotless of course, and smaller than those of any of the foregoing species, as the bird is much smaller in body than they are. The average size is 0·6 by 0·47 inch.

PASSERES.

Fam. ARTAMIDÆ *.

Bill wide at the base, somewhat conic in shape, the culmen and margin both curved, the gape slightly angulated, the tips of both mandibles notched in some species. Wings long and pointed, the 1st quill minute, not exceeding the primary-coverts. Tail short, of 12 feathers. Legs short.

Sternum posteriorly wide, with a deep notch in each half of the hinder margin.

Genus ARTAMUS.

Bill with the characters of the family, very stout at the base; the nostrils lateral, circular, and pierced in the horny substance of the mandible; gape curved; rictal bristles moderate. Wings very pointed, exceeding the tail; the 3rd quill slightly shorter than the 2nd, which is the longest; the secondaries falling short of the primaries by nearly the length of the tail. Tail even at the tip. Tarsus not exceeding the middle toe and claw, covered in front with stout transverse scales. Toes short, strongly scaled; outer toe slightly syndactyle, and longer than the inner; claws stout and well curved.

ARTAMUS FUSCUS.

(THE ASHY WOOD-SWALLOW.)

Artamus fuscus, Vieill. N. Dict. d'Hist. Nat. xvii. p. 297 (1817); Blyth, Cat. B. Mus. A. S. B. p. 199 (1849); Kelaart, Prodromus, Cat. p. 124 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 128; Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 161 (1854); Jerdon, B. of Ind. i. p. 441 (1862); Beavan, Ibis, 1865, p. 420; Blyth, Ibis, 1866, p. 369; Holdsw. P. Z. S. 1872, p. 440; Hume, Nests and Eggs, i. p. 194 (1873); Ball, Str. Feath. 1874, p. 403; Hume & Oates, ibid. 1875, p. 102; Ball, *t. c.* p. 291; Blyth & Walden, B. of Burmah, p. 126 (1875); Armstrong, Str. Feath. 1876, p. 321; Inglis, ibid. 1877, p. 30; Fairbank, *t. c.* p. 401; Davison & Hume, B. of Tenass., ibid. 1878, p. 223; Ball, ibid. vii. p. 211; Cripps, *t. c.* p. 273.

Artamus leucorhynchus (Linn.), M'Clell. P. Z. S. 1839, p. 158.

Ocypterus leucorhynchus (Linn.), Jerd. Cat. B. S. India, Madr. Journ. 1839, x. p. 237.

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* The Swallow-Shrikes are among the most singular of Old-World birds, and are so isolated that they might be considered to rank as a distinct family. Mr. Wallace, who was the first to place them near the Starlings, ably designates them as a "short-legged *Hirundine* modification of the *Sturnoid* type" of bird. They have been placed by some naturalists (Swainson and others) among the Shrikes, their notched bills and mode of feeding probably fostering this classification. By others, their long wings and aerial habits have been considered to indicate an affinity to the Swallows. The wing-structure, however, is that of a Starling and not a Swallow; and in the contour of the bill, the *slightly* angulate gape, and also in the structure of the sternum they resemble the former type.

Murasing Chatterer, *Brown-coloured Swallow*, Latham; *Ash-coloured Swallow-Shrike*, *The Ashy Swallow-Shrike*, Jerdon. *Murasing*, Mussulmen in Bengal; *Tari ababil*, Hind. in South, lit. "Palmyra-Swallow;" *Talchatak*, Bengal., and *Tati pitta*, Telugu, likewise "Palmyra-Swallow; *Silliangchi pho*, Lepchas.
Mādam Poru, Tamils in Ceylon.

Adult male and female. Length 7·1 to 7·4 inches; wing 5·1 to 5·3, expanse 15·0; tail 2·2 to 2·3; tarsus 0·65 to 0·75; middle toe and claw 0·75; bill to gape 1·0.

Iris dark brown (paler or reddish brown in the female); bill milky blue, with the tips of both mandibles blackish; legs and feet dusky bluish, claws dark plumbeous.

Females have, as far as my observations go, the base of the mouth yellow, while the male has the inside entirely black.

Head and hind neck soft slate-grey, changing into reddish cinereous on the back, scapulars, and rump, and passing round to the throat and fore neck, which are slightly dusky; lores and round the base of both mandibles blackish; upper tail-coverts whitish, the terminal portion only showing beneath the rump-feathers; wings and tail dark cinereous blue, the secondaries and shorter primaries with a fine terminal light edging; tail broadly tipped with whitish, the central rectrices with pale tips only; beneath, from the chest, dove-grey, tinged with rufescent, and paling to white on the under tail-coverts, which are crossed with narrow, wavy, grey bars.

The moulting-season commences about July in the southern districts, and birds in new feather are in the plumage above described. When the tips of the feathers wear off, the upper surface has a reddish-brown or rusty appearance, and the under surface becomes a sullied creamy white; the tail-feathers almost entirely lose their white tips, as do also the upper tail-coverts.

Young. In yearling plumage the young are dull earthy brown on the head and back, the feathers faintly margined with a paler colour. Secondaries and inner primaries *broadly tipped with white*; throat duskier than in the adult, blending gradually into the hue of the breast, which is ruddier than in the adult.

Obs. Examples in the national collection from Nepal and Behar measure 5·2 and 5·3 inches in the wing; two from Madras 5·15 and 4·95; several others, locality not indicated, 5·0, 5·2, and 5·3—showing that, on the whole, they average about the size of our birds. As a rule, these examples are *slightly* redder beneath than the Ceylon race, and there does not seem to exist in them that *faint* trace of obsolete barring which is observable in some Ceylonese specimens; in a larger series, however, this unimportant character might be revealed. *Artamus leucorhynchus*, Linn., now united to the Australian *A. leucopygialis*, Gould, was, it appears, formerly confounded with this species, and appears in Kelaart's 'Catalogue of Ceylon Birds,' on what authority we know not. It inhabits the Andaman Islands, the Philippines, Java, Borneo, Sumatra, and other islands of the Malay Archipelago, as well as Australia, and is a very distinct species from the present; the head and neck are bluish slate, and the back and wings chocolate-brown; the under surface from the throat downwards, together with a broad band across the rump, pure white; tail blackish. A Labuan example measures in the wing 5·5 inches, tail 2·6, bill to gape 1·1; Andaman specimens, according to Mr. Hume, average smaller than others; but the Marquis of Tweeddale did not consider them specifically separable. The size of wing given in 'Stray Feathers,' 1874, p. 214, for Andaman birds, is 5·0 to 5·25 inches.

The Indian bird is more closely allied to *A. personatus*, Gould, from Australia. This latter has the ear-coverts, as well as the lores, black; the chin and upper part of the throat blackish slate, not coming down so far on the fore neck as the dark hues in *A. fuscus*; breast and flank reddish ashy, paling into white on the vent and under tail-coverts; back greyer than in our bird, with no white bar across the tail-coverts; tail grey, tipped with white. It differs in many more particulars, but has a general resemblance to our bird.

This interesting genus is mainly developed in Australia, eight species being represented in Mr. Ramsay's recent list of Australian birds (Proc. Linn. Soc. N. S. Wales), and thirteen inhabiting the entire *Australian region*.

Distribution.—The Wood-"Swallow" is widely distributed throughout all the low country, inhabiting most numerously open lands and the borders of lagoons in the maritime districts, especially along the east coast, and down the west side as far as Negombo. Further south, where these open tracts disappear (except at Panadure, where it is again numerous), it is chiefly found in the interior, being very common even in the wooded districts of Saffragam. In the northern forest tract it chiefly frequents the open lands round the

great inland tanks. From the Eastern Province it ranges into Uva and Haputale, in both of which parts it has been observed on patnas and bare hills up to 5000 feet; but in the Kandy district it is not so common. It is found in the northern islands, as well as in the Erinativoe group. Mr. Holdsworth found that it quitted the Manaar district in the south-west monsoon; it is, however, resident close to Colombo all the year round.

Jerdon writes that this Swallow-Shrike is spread throughout the whole of India, but locally distributed; "for you may pass," he says, "over large tracts of country, apparently well suited for them, and not see one." He found it most abundant in the Carnatic, the Malabar coast, the northern circars, and Bengal, very rare in the Deccan and Central India; he also met with it on the sides of the hills at Darjiling. Captain Beavan observed it at Barrackpore in the month of January, and likewise at Darjiling, at an elevation of about 5000 feet. The Rev. Dr. Fairbank procured it also at 4500 feet on the Palani hills, but he does not record it from the Deccan. Mr. Ball met with large flocks of it at Singhbhum, and records it from the Godaveri valley, Sambalpur, and other places northwards to the Rajmehal hills. From Bengal it extends into Burmah and as far as Assam in a northerly direction. Dr. Armstrong remarks that he found it very abundant throughout the entire Irrawaddy delta from China Ba-keer to Rangoon, and that it was especially numerous near villages. Southwards it seems to diminish, as it is only noticed by Mr. Hume as a rare straggler in Tenasserim proper. It seems to avoid the western side of the peninsula altogether, as I do not find it recorded by any observers from Sindh or any of the surrounding districts; and, in the sub-Himalayan region, Nynee Tal seems to be its most westerly point.

Habits.—The favourite localities with this bird in Ceylon are open hill-sides or clearings in the low country studded with dead trees, the paddy-fields surrounding the brackish lagoons in the Western Province, open tracts bordering estuaries on the east coast, palmyra-groves and the borders of plains in the north, while in some districts in the Western Province it frequents open places in the midst of heavy forest; in the Kandyan Province it affects bare hill-sides and patnas dotted with trees. It is exceedingly fond of scattered groves of palmyras close to the sea-shore, resting on the fronds of these trees when not hawking for insects, and roosting on them at night. It associates in small flocks, perching together in closely packed rows, and sallying out in twos and threes after its food, which it catches on the wing, circling round, and sometimes mounting, with a buoyant flight, high in the air, where it will occasionally soar for a considerable time with outstretched wings. It is always of a most sociable nature; and when a flock is scattered by the shooting of one of their number, they speedily reunite on a neighbouring tree. It is partial to the vicinity of water, as in hawking above the surface of tanks and lakes it finds an abundance of food. In its mode of feeding it resembles the Drongo-Shrikes, beating its prey (which consists largely of beetles) to death on its perch before it swallows it. Its ordinary note resembles somewhat that of the Red-breasted Swallow, and is mostly uttered while the bird is on the wing; Jerdon likens it to the cry of the *Shikra*, but more subdued of course. He writes of it, "At times I have seen an immense flock in the air, all together, hunting for insects, and remaining on the wing for a much longer period. A small party may occasionally be seen skimming over the surface of a tank, picking up an insect now and then, and returning to a high bough of a tree overhanging the water."

I may mention here that one species in Australia (*Artamus sordidus*) has the singular habit of clustering in numbers like bees to the dead branches of trees.

Nidification.—The breeding-season of the Wood-Swallow is in February and March, both in the north and central districts. It builds in the former region, to a great extent, in the palmyra-palm, placing its nest between the bases of the fronds. A nest which I found so situated in Erinativoe Island was composed of grass and roots, massive in exterior and rather slovenly put together; the interior was a shallow cup about $2\frac{1}{2}$ inches in diameter, and contained three nestlings. Mr. Bligh informs me that he has found the nest in the hole of a tree situated in a coffee-plantation.

Layard writes that they "build a cup-nest, composed of fibres and grasses, in the heads of cocoanut-trees, on the base of the large fronds. . . . . When the nestlings have left their cradle," he says, "they may be seen sitting side by side on a branch, whilst the old birds fly off for insects and return to feed their offspring by turns. Even after the young birds can shift for themselves they keep up their gregarious habits, and return to their bough after each hunting-excursion."

Jerdon found the nest in a palmyra-tree; and I am of opinion that this tree is probably resorted to, in districts where it grows, more than any other. He describes the nest as cup-shaped and deep, made of grass, leaves, and numerous feathers. It contained two eggs, white, with a greenish tinge, and with light brown spots, chiefly at the larger end. Mr. Gammie found a nest, however, in a hole in a dead tree near Darjiling, about 40 feet from the ground; it was made of coarse roots, devoid of lining. The eggs were three in number, narrow ovals, pointed towards one end; "the ground-colour was creamy white, and the markings almost entirely confined to a broad ring round the large end, and the space within it consisted of spots and clouds of very pale yellowish brown, intermingled with clouds and specks of excessively pale, nearly washed-out lilac." Dimensions 0·92 to 0·97 in length by 0·7 to 0·72 inch in breadth.

Mr. Cripps, in his recent paper, writes of some nests taken in date-trees (*Phœnix sylvestris*); they were built at the junction of the leaf-stem and trunk, though in two instances they were placed on a ledge from which all the leaves had been removed to enable the tree to be tapped for its juice. In every instance the nest was exposed, and if any bird, even a Hawk, came near, the courageous little fellows, says Mr. Cripps, would drive it off. "The nests were shallow saucers, made of fine twigs and grasses, with a lining of the same, and contained two to four eggs each."

PASSERES.

Fam. STURNIDÆ.

Bill straight or slightly curved; very stout in some, moderate in others; the tip notched, the gape *receding* and *angulated* in most genera; the base of the bill feathered down to the nostril on each side of the culmen*; gape smooth. Wings with the 1st quill less than or equal to the primary-coverts; the 2nd and 3rd the longest. Tail of 12 feathers, shorter than the wing. Legs and feet stout. Tarsus shielded with broad, stout, transverse scutes; lateral toes subequal; hind toe and claw large.

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* *Saraglossa*, Hodgson, appears to be an exception as regards Asiatic genera, the base of the bill not dividing the frontal plumes.

Genus ACRIDOTHERES.

Bill stout, rather straight, the tip notched and the gape strongly angulated ; nostrils placed in a depression, the frontal feathers concealing them. Wings long and pointed ; the 1st quill less than the primary-coverts, the 3rd the longest, and the 2nd longer than the 5th. Legs and feet very strong. The tarsus longer than the middle toe and its claw, covered in front with four stout scales ; toes strongly scaled, the outer syndactyle and longer than the inner, and both considerably shorter than the middle ; hind toe and claw very large.

Orbital region nude ; head crested, the feathers narrow and much attenuated.

ACRIDOTHERES MELANOSTERNUS.

(THE CEYLONESE MYNA.)

(Peculiar to Ceylon.)

Acridotheres tristis, Blyth, Cat. B. Mus. A. S. B. p. 108, spec. E, F, ex Ceylon (1849) ; Kelaart, Prodromus, Cat. p. 125 (1852) ; Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 218 ; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 532 (1856) (in part) ; Jerdon, B. of Ind. ii. p. 325 (1863) (in part) ; Holdsw. P. Z. S. 1872, p. 462 ; Hume, Str. Feath. 1873, p. 440 ; Legge, Ibis, 1874, p. 23.

Acridotheres melanosternus, Legge, Ann. & Mag. Nat. Hist. 1879, iii. p. 168.

The Paradise Grackle (Kelaart) ; *Martintro*, Portuguese in Ceylon ; *Field-Myna* of Europeans. *Na-canam patchy*, Tamils, *apud* Layard.

Gon kawada, *Gon kowdichya*, Sinhalese.

Ad. similis *A. tristi*, sed ubique saturatior, et gutturis nigredine magis extensâ et per pectus medium deductâ.

Adult male and female. Length 9·2 to 10·75 inches ; wing 5·4 to 5·8 ; tail 3·2 to 3·4 ; tarsus 1·5 to 1·7 ; middle toe and claw 1·45 ; bill to gape 1·3 to 1·38.

Iris variable, pink-brown and pinkish grey in some, in others whitish mottled with fine specks of dark colour ; bill yellow, blackish at the sides near base of lower mandible ; legs and feet sickly yellow ; orbital skin yellow, this extends round the eye, but, being very narrow above, is hidden by the superciliary feathers.

Head, nape, upper part of hind neck, chin, and throat black, the feathers of the head and nape long, narrow, and lanceolate, forming a crest ; hind neck, back, scapulars, tertials, wing-coverts, sides of the chest, and the flanks buff-brown, with the black of the chest descending *in a stripe down the centre of the breast*, blending into the adjacent colour and passing round above the abdomen, which, with the vent and under tail-coverts, are white ; quills, the primary-coverts partially, and the tail brown-black ; the bases of the primaries, the outer webs of some of the primary-coverts and the inner webs of others, the edge of the wing, and the under wing-coverts white, as are also the tips of all but the centre tail-feathers, decreasing towards the centre ; thigh-coverts blackish brown.

The tail in this species becomes remarkably abraded, the white tips sometimes entirely disappearing.

Young. Rufous above, deepening into blackish brown on the occiput and head, with which the face, chin, and throat are concolorous ; feathers of the head not elongated ; wings and tail paler brown than in the adult ; sides of the chest and breast light russet-brown ; down the centre of the breast the feathers are blackish slate (that is, not so dark as in the adult), and the white of the abdomen advances further up and is not bordered with blackish ; the feathers of the neck and back have faint tippings of rufous-grey, more pronounced in some than in others.

Obs. The Ceylonese Myna forms a closely allied race or subspecies of the Indian bird (*A. tristis*), differing from the latter in its darker plumage, both as regards the back and flanks, and likewise in the *black coloration of the centre of the breast and upper border of the white abdomen*, on the strength of which latter character I have established its rank as an island race. Blyth first pointed out that it was darker than the Indian form, but does not seem to have noticed the black breast, which is entirely different from this part in any continental specimen that I have seen. Jerdon likewise remarks that it appeared to be darker. I have before me eighteen examples belonging to the national collection from all parts of India, as well as from Burmah, and from Réunion and Mauritius, in which islands they were acclimatized from India; and they all have the centre of the breast somewhat paler than the surrounding plumage, which varies from a pale, though sullied, isabelline to a fine russet colour. The centre of the lower part of the breast is slightly pervaded with the pallid hue of the abdomen, the converse of which is the case in the island bird. The only approach made to this character in any Indian specimens I have seen exists in the case of two specimens from Malabar, which have the *inner webs* of the feathers at the *centre of the upper part of the breast* blackish brown; but this presents a totally different appearance to the black band down the whole sternal region of the Ceylonese race. The wings of Indian examples of *A. tristis* vary from 5·3 to 6·0 inches—5·5 inches being the usual dimension, judging from the series I have measured.

Mr. Hume observes (*loc. cit.*) that he does not find the Indian birds any paler than Ceylonese; he, however, does not comment upon the dark *breasts* of the latter. It is possible that he may have noticed the same character in some continental birds; but as none of the specimens in the tolerably large series I have examined exhibit any further tendency to it than that above noticed in the Malabar examples, the Ceylonese race, in my opinion, is a good one.

Distribution.—This well-known bird is exceedingly abundant in the cultivated portions of Ceylon, frequenting both sides of the island alike, and being as numerous in the hot districts of the north as in the more humid region comprised in the south-west corner. In districts where large tracts of pasture-land or of paddy cultivation prevail the Myna shows up in great numbers. About the Panadure and Bolgodde Lakes, between Matale and Galle, in the Battiealoa rice-fields, in the green pastures on each side of the Virgel, and in the open fields of the Jaffna peninsula it is to be seen in hundreds. But it is not always in such places that it throngs, for I found it numerous in the hill-begirt lands of the western part of the Pasdun Korale and in similar localities in the Galle district. It ranges into the Central Province to a considerable altitude, reaching its highest limit, I believe, in the dry cool season. Mr. Forbes Laurie has seen it in Maturatta at 3500 feet, and in Kalebokka at 3000 feet, and I have seen it at Uva higher than either of these elevations.

Its near ally in India is a very abundant bird and is seattered over all the low country of the empire, extending into Burmah and Tenasserim. It ranges into the mountains to a considerable altitude, breeding at Mussoori, and occurring in the Palanis up to 4000 feet.

It may not be out of place to mention here that it has been successfully acclimatized in Victoria, where it may be seen in Melbourne frequenting the villas in the suburbs and everywhere making itself at home upon the housetops. It has also been introduced, with the same result, into the Mauritius.

Habits.—This Myna takes the place in Ceylon of the English Starling. It is one of the most familiar species in the island, taking up its abode in the native husbandman's paddy-field and assiduously attending on his cattle and buffaloes, about which it obtains an abundance of food, in the way of flies attracted by the animals, ticks living on them, and other insects to be found about oxen. Each field has its little party of half a dozen or more, which pass their time between the pastures and the surrounding cocoanut-trees, and at evening fly away towards the common roosting-place, where the Mynas, for many miles around, resort with common consent to pass the night. Such a colony as this I once discovered on the shores of the Bolgodde Lake; here a large reed-bed was the nightly rendezvous, and from all points of the compass were to be seen little flocks flying low and swiftly across the broad expanse of water, and settling down with much chattering, fighting, and squabbling in the tall and sheltering reeds. On my firing a gun the whole rose *en masse*, like a dark cloud, and filled the air for the moment with a booming sound. Another but a smaller colony I found taking up its quarters in an isolated knoll in a paddy-field in the Pasdun Korale. In the Central Province it frequents open patnas, where the cattle of the Singhalese villagers are to be found grazing, and roosts in the areca- and sugar-palms near the villages. It feeds on caterpillars and worms as much as any thing else, and scratches in the ordure of cattle for grubs; it may often be seen perched on the backs of cattle and scrutinizing their skins with as much audacity as the Crow! Its walk is erect, and its

general deportment rather stately. Its flight is steady and straight, being performed with regular beatings of the wings. It lives well in confinement, and is a favourite caged bird with the natives, who teach it to speak; but it is not so proficient a talker as the Grackles, nor are its ordinary notes and whistles to be compared, in point of clearness or power, with those of the Glossy Mynas. It is noteworthy that in Ceylon it has not the same familiar habits in dwelling about houses and in towns as its Indian ally, whose domestic propensities are particularly noticeable in Australia, where it has been acclimatized. Blyth remarks that this latter species mingles in Calcutta frequently with the Crows, and that a pair not unfrequently entered his sitting-room and treated him to a loud screeching sòng. Another writer says that it is "a brisk, lively bird, apt to learn words and to whistle, and becomes very attached to its master—so much so that instances are known in which it has been allowed to range abroad during the day with a confidence of its return at night."

Concerning the Ceylon race Layard writes:—"They frequent meadows in search of worms and grubs of insects, not refusing perfect Coleoptera when they come in their way; they scratch among the ordure of cattle (whence their native appellation), and scatter it far and wide over the fields, thus assisting the lazy native husbandman."

Nidification.—This species breeds in Ceylon from February until May, nesting perhaps more in the month of March than in any other. It builds in holes in trees, often choosing a cocoanut-palm which has been hollowed out by a Woodpecker, and in the cavity thus formed makes a nest of grass, fibres, and roots. I once found a nest in the end of a hollow areca-palm which was the cross beam of a swing used by the children of the Orphan School, Bonavista, and the noise of whose play and mirth seemed to be viewed by the birds with the utmost unconcern. The eggs are from three to five in number; they are broad ovals, somewhat pointed towards the small end, and are uniform, unspotted, pale bluish or ethereal green. They vary in length from 1·07 to 1·2 inch, and in breadth from 0·85 to 0·92 inch.

Layard styles the eggs "light blue, much resembling those of the European Starling in shape, but rather darker in colour."

The figure in the Plate accompanying my article on *Eulabes ptilogenys* is from a specimen shot in the Pasdun Korale.

Genus PASTOR.

Bill not so stout as in *Acridotheres*, compressed, slightly curved at the tip. Wings very pointed; the 1st quill small, the 2nd the longest, the 3rd and 4th slightly shorter. Tail moderate and even. Legs and feet stout, but not so much so as in the last genus.

Head furnished with a long crest. Highly gregarious in habit.

PASTOR ROSEUS.

(THE ROSE-COLOURED STARLING.)

Turdus roseus, Linn. Syst. Nat. i. p. 294 (1766).

Pastor roseus (Linn.), Temm. Man. d'Orn. p. 83 (1815); Gould, B. of Europe, vol. iii. pl. 212 (1837); Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. p. 23; Blyth, Cat. B. Mus. A. S. B. p. 111 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 217 (1854); Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 539 (1856); Jerdon, B. of India, ii. p. 333 (1863); Gould, B. of Gt. Britain, vol. iii. pl. 55 (1863); Shelley, B. of Egypt, p. 157 (1872); Holdsw. P. Z. S. 1872, p. 462; Dresser, B. of Europe, pt. 21 (1873); Ball, Str. Feath. 1874, p. 419; Hancock, Cat. B. of Northumb. p. 43 (1874); Ball, Str. Feath. 1875, p. 208; Butler & Hume, *t. c.* p. 498; Scully, ibid. 1876, p. 164; Newton, ed. Yarrell's Brit. B. pt. xii. p. 243 (1878); Davidson & Wender, Str. Feath. 1878, p. 85; Ball, *t. c.* p. 221.

The Rose-coloured Pastor, *The Pastor* of some writers; *Cholum-bird*, Europeans in Madras; *Juari bird* in Bombay. *Golabi maina*, Hind., also *Tiliyer* in the south; *Pariki pitta*, Telugu; *Sura kuravi*, Tamil; *Bya*, Sindh; *Sách* in Turkestan.

Adult male and female (from a series of European and Indian examples). Length 8·0 to 9·5 inches; wing 5·0 to 5·4; tail 3·0 to 3·3; tarsus 1·05 to 1·1; middle toe 1·0; hind toe 0·55, its claw (straight) 0·3 to 0·4; bill to gape 1·05 to 1·2.

Iris brown; "bill orange-yellow at the base, then pinkish, and brown at the tip" (*Jerdon*); legs and feet dusky fleshy red.

Autumn plumage. After the annual moult the head, crest, neck, and throat are black, the feathers tipped with greyish white, almost covering the plumage on the chin, face, and below the ear-coverts; on the back and breast the bases of the feathers are roseate, and the tips brownish or snuff-colour; wings and tail black, the feathers margined with greyish. This plumage is retained throughout the winter, at the latter end of which the grey margins of the feathers wear off, and the plumage assumes the pure and brilliant colours characteristic of the species, and which I shall describe as the *breeding-plumage*:—

Head with long occipital crest, entire neck down to the interscapular region above and the centre of the chest beneath glossy purple-black; back and rump with the scapulars, breast, abdomen, flanks, and lower part of the sides of the neck pale delicate rose-colour; wing-coverts, innermost secondaries, and upper tail-coverts deep glossy greenish black; quills blackish, the outer margins glossed with greenish, most conspicuously on the secondaries; inner webs pale brownish; tail black, glossed with a less bluish green than the wing-coverts; under tail-coverts, thighs, and superlying flank-plumes green-black, the longer covert-feathers tipped with white; under wing blackish brown, the feathers tipped with white, the under secondary-coverts broadly edged with roseate.

The above description is taken from a beautiful specimen shot in June at Genoa, and in the national collection. All examples killed at the same time, however, are not in such perfect nuptial attire: some have the dark head and throat and the roseate plumage perfect; but the bases of the body-feathers are more or less black, and there is a black stripe down the inner edge of the scapulars; the feathers at the edge of the wing above the metacarpus, and those beneath it, as well as the under tail-coverts and lower flank-plumes, are broadly edged with white. Specimens collected in Northern India by Mr. Hodgson are in this plumage; and I conclude that these must have been procured just before the birds left the country, and while they were acquiring the breeding-attire.

The female in autumn plumage is duller in colour than the male, but otherwise resembles it; the crest is said to be smaller.

Young (Colombo: November 1876). Iris brown; bill above brownish; gape and base of upper mandible yellowish, tip of the lower dusky; legs and feet fleshy.

Head and hind neck sandy brown, paling to albescent on the throat; the crest absent; across the throat and round the lower part of the hind neck a black zone or band defining what would be the edge of the black throat in the adult; back, scapulars, rump, breast, and abdomen impure roseate, mixed on the back with darkish feathers and washed with a sandy hue; some of the quills and the wing-covert feathers, as well as some of the tail-feathers and the under tail-coverts, black, the latter broadly edged with white; the remaining feathers in these parts dun-brown, which is the colour assumed in the nest-plumage.

Obs. Few species exhibit, in so plain a manner, the change that can be brought about in a bird's plumage by abrasion as the Rose-coloured Starling. We have only to lift up the feathers in the grey-tipped autumn attire, and we at once discover the brilliant rosy tint of the chief portion of the feather. Mr. John Hancock, one of the most accurate ornithological observers living, in a long article on this species contained in his interesting catalogue of the birds of Northumberland, remarks that the young, after the first moult, when they are in the plumage above described as "Autumn," could, in a short time, "with the aid of a pair of scissors, be made to assume the rosy tint and fine glossy black of the breeding birds." He is of opinion that many of the birds said by Jerdon to be in immature plumage on their arrival in India are in reality in the adult autumn dress just after their moult. This may be the case; but, on the other hand, it must be remarked that young birds of a wandering species do migrate, as a rule, more than adults; and I suspect that the majority of the "Rosy Pastors" which visit the south of India are young. All the specimens which were procured out of the flock which visited Ceylon in the autumn of 1876 were immature, some of them being in the act of acquiring their first autumn plumage, which certainly was not that of the adult, for the back-feathers were not rosy enough at the bases and there was no crest.

Distribution.—The Rose-coloured Starling, in the same mysterious way in which it appears in other countries, has from time to time visited the island in large flocks, consisting of young birds, the time of its arrival, on one or two occasions, having been, singularly enough, during the season that it is said to breed in Western Asia. Layard notices in his catalogue that large flocks appeared at Pt. Pedro during July, when, as Jerdon remarks in the 'Birds of India,' p. 335, the young would only just have been fledged. This circumstance favours the opinion that the species breeds, as has been stated, in the south of India; but this fact requires confirmation. Subsequent to the above occurrence, as is also noticed by the same author, flocks appeared at Puttalam; and Mr. Holdsworth is of opinion that he saw a flock at Aripu in 1856. In November and December (1876) a flock visited the Cinnamon-gardens, Colombo, frequenting the bushes and trees in the "Circular;" and several specimens were shot, some of which are mounted in the Colonial Museum. As in other instances, the birds remained about for a few days, and then disappeared as suddenly as they came. On inquiry I learnt that a Singhalese, who had shot some of these birds, was acquainted with them, having once or twice seen them in the west of Ceylon prior to that occasion. Captain Wade, 57th Regt., met with a flock at Wackwella, near Galle, about the same time, and informs me that the natives there said they had never seen the bird before.

It is difficult to assign any particular region as the home of this singular bird. Its head-quarters may, perhaps, be said to be parts of Western Asia, from Turkestan to the Caspian. To the north-west of this region it migrates in vast hordes into Europe, visiting South-eastern Russia, Turkey, and other districts on the Mediterranean in great numbers, and wandering thence in more or less extensive tribes into Hungary, South-eastern Germany, France, and Spain, into which country it is, as also to Great Britain, a rare visitant; isolated examples have likewise reached Finland, Lapland, and Sweden, but not Norway. Its visits, however, to Europe are uncertain; it is not looked for as an annual arrival, but surprises people by making a sudden appearance in myriads, and after breeding departs as mysteriously as it came. It was first observed in England at Norwood, where an example was killed in 1742, and noticed by Edwards. It has not unfrequently, according to Mr. Hancock, been procured in Northumberland and Durham; and its occurrence in Cornwall, the Scilly Isles, Wales, and all parts of Scotland is, in accordance with the testimony of numerous observers, recorded in the new edition of Yarrell by Professor Newton. It makes its appearance in Russia and Turkey in the month of April, which is about the time when it leaves India, after its visit to that country during the cool season, for Western Asia. It breeds, according to Severtzoff, in Turkestan; and the birds which rear their young in that country may be those which have wintered in India. Dr. Scully remarks that it is said to be common in Khokand and Badakhshan, but that the Yarkandi bird-catchers say it only occurs as a mere straggler in Kasgharia, a few birds being occasionally seen in the summer, after the prevalence of strong north-west or

westerly winds. It appears to avoid the districts immediately to the west of the Indus, not being found anywhere in that direction, save in the north-east of Persia. It is a visitor to Palestine, breeding there. It arrives in India about August (indeed Mr. Ball saw them in the Suliman hills at the end of July), and during the interval between that and the following month, myriads, says Mr. Hume, pass through the plains of India. They make their appearance in the Carnatic and the Deccan about November, and they quit the south of India in March, passing through Sindh in April on their way back. The Rev. Dr. Fairbank writes that it visits the Deccan in vast flocks, and remains until April. In Chota Nagpur it is, according to Mr. Ball, a regular visitor in February, remaining as late as April. In that district he records it from Manbhum, Sirguja, and Gangpur, and also from Sambalpur and other places north of the Godaveri river, so that it would appear not to visit the eastern portions of the empire until near its time for leaving India. I find no record of its occurrence to the eastward of the Bay of Bengal; but Col. Tytler mentions its having visited the Andamans in January; since this, however, the bird has not been seen by any subsequent observer. Finally, as regards its wanderings to the south, Sundevall records two young individuals coming on board the ship he was sailing in while crossing the Indian Ocean, one of which alighted on the vessel "halfway between Ceylon and the north point of Sumatra, at least 100 geographical miles from each, and 80 or 90 miles from the Andaman Islands."

The strangest feature in its distribution is its avoiding the African continent while it visits the opposite shores of the Mediterranean in such numbers. But one instance of its capture on the soil of Africa is recorded, and this is by Von Heuglin, who mentions a young bird being killed at Cairo in 1864.

Habits.—This handsome bird frequents open land, interspersed with bushes and low jungle, grain-fields, and cultivated country, in which it commits devastations at crop-time. It feeds on seeds of grass and plants, fruit, grain, and also, according to Jerdon, on insects. Concerning its habits in South India, a writer (Mr. Elliot) quoted by Jerdon remarks that it "is very voracious and injurious to the crops of white 'Jowaree' (*Andropogon sorghus*), in the fields of which the farmer is obliged to station numerous watchers, who, with slings and a long rope or thong, which they crack dexterously, making a loud report, endeavour to drive the depredators away. The moment the sun appears above the horizon they are on the wing; and at the same instant shouts, cries, and the cracking of the long whips resound from every side. The 'Tillyers,' however, are so active, that, if they are able to alight on the stalks for an instant, they can pick out several grains. About 9 or 10 o'clock A.M. the exertions of the watchmen cease; and the Tillyers do not renew their plundering until evening. After sunset they are seen in flocks of many thousands retiring to the trees and jungles for the night." Layard found the young birds at Pt. Pedro very wary; but those which appeared in the cinnamon-gardens in 1876 were far from shy; they settled on the tops of low trees and were easy of approach. It is very omnivorous in diet, feeding much on insects, fruit, and even flowers, as well as on grain. "According to Chesney," says Dr. Jerdon, "they are called locust-eaters in Persia;" and they have been said by other writers to devour large quantities of these pests. In the north of India they devour large quantities of mulberries, being there called the "Mulberry-bird" in consequence. Hutton relates the same of it at Candahar. Both Mr. Blyth and later writers in 'Stray Feathers' observe that they are much in the habit of frequenting the cotton-tree when it is in flower, feeding, no doubt, upon its flowers. Sundevall relates that the two captured on the ship above mentioned fed on cockroaches.

The Rose-coloured Starling has a steady straight-on-end flight, and proceeds in closely-packed flocks from place to place. The note of the male bird is described by Sig. de Betta as being a continuous babble, mixed with harsh and disagreeable notes; and the cry of the female is equally stridulous and peevish.

Nidification.—April, May, and June are the months during which the "Pastor" has been found to breed in Europe. It nests in company, vast flocks laying their eggs on the ground in nests made of sticks, straw, wool, and whatever other miscellaneous material the locality besieged by the invading horde can afford. Von Nordmann says the nest is a largish, round, bowl-shaped structure, neither firm nor very neat, the materials being gathered assiduously by both cock and hen. In writing of a vast breeding-colony which he visited in 1844 near Odessa, he says that the birds "took possession of every wall or heap of stones that offered a chink for the nest," and that stone-quarries were equally inhabited throughout the whole neighbourhood. The eggs were from six to nine in number, but generally there were six or seven in

each nest . . . So soon as the broods were flown, they repaired to the nearest gardens, where they clustered on the trees by thousands, while their parents fed them with locusts brought from the neighbouring steppes; and these assemblages were scenes of the greatest noise and confusion imaginable." The Marquis O. Antinori gives an interesting account in 'Naumannia,' 1856, p. 407, of a wonderful breeding-assemblage at Smyrna, where the nests were by thousands in the neighbouring hills, "some quite open and uncovered, others so hidden under blocks of stone that these needed turning to examine them; some were at the depth of about a foot, others could not be reached by the arm." In this case the nests were built without any skill, "the bird being content with a cavity scraped in the soil, in which were to be found sundry straws or leaves of the *agnocasto*, and very seldom a border of grass-stalks." Wonderful as must have been these colonies of the Rose-coloured Starling, they must have been outdone by another established so late as June 1875 at Villafranca, and concerning which Signor de Betta has written in the 'Atti del R. Istituto Veneto,' ser. 5. I append the following extract of his account, taken from Professor Newton's edition of Yarrell's 'British Birds':—"In the afternoon of June 3rd, 1875, a flock of about twenty birds alighted on the high ruins of the castle at that place, and was presently followed by another of about a hundred, which by their cries attracted the notice of the inhabitants. Later in the evening there arrived many thousands more, which joined the first comers, and at dusk all dispersed in numerous troops over the country. Before daybreak the next morning, however, the people were awakened by the cries of some 12,000 to 14,000 Starlings, which met at the castle and completely took possession of it, ejecting, after a sharp struggle, the other birds which were its ordinary occupants, and, since its walls did not then even afford sufficient accommodation, overflowed to the neighbouring housetops. The new arrivals at once set to work clearing out the rubbish from the holes and fissures they had thus gained, and, that done, on the morning of the 5th they began to build their own nests of twigs, straw, hay, and other dry plants, leaving a hollow, lined with roots, leaves, moss, and feathers, in the middle for the eggs. The next few days were occupied by constant strife for sites and fierce contests between the males, who showed, however, the most ardent attachment for their partners; and it was not until the 17th that Sig. de Betta (who made several visits to Villafranca at this interesting period) was able to ascertain that eggs, five or six in number, were laid; yet by July 10th the young, having been most assiduously fed with locusts by their parents, were able to take flight with them on the 12th. On the 14th all the remainder were seen to depart, and Villafranca, to the great regret of its inhabitants, was absolutely deserted by its unusual visitors."

The eggs are like those of the Common Starling, but more glossy and of a paler blue; they are described in Yarrell's 'British Birds' as being of a glossy french white, with a very faint tinge of bluish green or greenish blue, measuring from 1·12 to 1·08 by 0·85 to 0·81 inch.

Genus STURNIA.

Bill rather small, compressed, moderately straight; nostrils exposed; gonys-angle imperceptible. Wings with the 1st quill very minute, the 2nd and 3rd subequal and longest, the 4th scarcely shorter. Tail short, the tips of the feathers pointed; under tail-coverts lengthened. Legs and feet not so stout as in the last genus; tarsus covered with stout scutes, and equal to the middle toe with its claw.

Of light form; head usually highly crested. Of mostly arboreal habit.

STURNIA PAGODARUM.

(THE BRAHMINY MYNA.)

Turdus pagodarum, Gmel. Syst. Nat. i. p. 816 (1788).

Temenuchus pagodarum (Gmel.), Cabanis, Cat. B. Mus. Hein. i. p. 204 (1851); Jerdon, B. of Ind. ii. p. 329 (1863); Holdsw. P. Z. S. 1872, p. 462; Adam, Str. Feath. 1873, p. 386; Hume, Nests and Eggs, ii. p. 432 (1874); Ball, Str. Feath. 1874, p. 419; Legge, Ibis, 1875, p. 398.

Pastor pagodarum (Gmel.), Wagler, Syst. Av. *Pastor*, sp. 8 (1827); Sykes, P. Z. S. 1832, p. 95.

Sturnia pagodarum (Gmel.), Blyth, J. A. S. B. 1844, xiii. p. 363; id. Cat. B. Mus. A. S. B. p. 110 (1849); Fairbank, Str. Feath. 1877, p. 407; Ball, ibid. 1878, vii. p. 221.

Hetærornis pagodarum (Gmel.), Gray, Gen. Birds, ii. p. 335 (1846); Kelaart, Prodromus, Cat. p. 125 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 217.

The Black-headed Myna, Jerdon, B. of India; *The Pagoda Starling, Pagoda Myna* (Kelaart). *Popoya Maina*, Hind. (Jerdon); *Monghyr Pawi*, Bengal.; *Puhaia*, Upper Provinces of India (Blyth); *Martintro*, Portuguese in Ceylon.

Adult male and female. Length 8·0 to 8·3 inches; wing 4·1 to 4·3; tail 2·3 to 2·7; tarsus 1·05 to 1·2; middle toe and claw 1·1; bill to gape 1·05.

Iris white or greenish white; bill with the basal half blue, which extends to the inside of the mouth, terminal half gamboge-yellow; legs and feet pale or sickly yellow; claws yellow.

Lores, head above, round the gape, and point of chin shining black, the feathers of the occiput and nape much attenuated and very long, forming a crest 1·5 inch long in fine examples, and which reaches down to the back; neck, throat, and all beneath, except the abdomen, red-buff, the centres of the feathers on the throat, chest, and hind neck, where they are attenuated as in the crest, paler; back, wing-coverts, tertials, the greater part of outer secondary webs, lower flanks, thighs, and central tail-feathers dove-grey, the latter with a shade of brown; primaries, winglet, inner part of secondaries, and remaining tail-feathers brown-black, the primaries washed with greyish at their tips; under wing-coverts and tips of tail-feathers white, which extends half up the lateral pair; abdomen and under tail-coverts white, washed with buff.

In abraded plumage the centres of the throat and chest-feathers become very light, giving a striated appearance to these parts.

Young. Birds of the year in nestling plumage have the iris bluish white, slightly mottled, and with a dark inner rim; the bill coloured as in the adult, but with the colours duller; feet not so yellow.

The head is brown and crestless and dusky ashy grey in colour; the wing-coverts and tertials pervaded with brownish and the quills not so black as in the adult; beneath, the throat and breast are fawn-grey, paling to albescent on the belly and under tail-coverts. Before acquiring the adult dress the grey plumage appears to become paler; and during the change examples may be obtained in a curious-looking attire, some having the whole of the lower parts (both on the breast and back) in adolescent plumage, sharply defined against the duller lines of the head and neck in the dress of the nestling.

Obs. Indian specimens from the Himalayas southwards are identical with Ceylonese; they vary *inter se* in the length of the crest (probably due to age), intensity of the red under-surface coloration, distinctness of the chest- and neck-striæ, and the amount of white at the tips of the tail-feathers. Mr. Ball gives the dimensions of a Chota-Nagpur example (Sirguja) as—wing 4·2 inches, tail 2·8, tarsus 1·1; two males in the national collection from the N.W. Provinces have the wings 4·1 and 4·3 inches, and the bills to gape 0·95 and 0·96 inch respectively; one from Kamptee—wing 4·2 inches, bill 0·98 inch; two from the N.W. Himalayas—wings 4·1 and 4·2 inches, bills 0·92 and 0·96: the latter has an unusually long crest (1·9 inch), and the coloration of the underparts very rich, with the striæ scarcely indicated.

Sturnia malabarica, Gmelin (the Grey-headed Myna), inhabits the peninsula of India from the north to the southern portion, and might perhaps some day occur in Ceylon. It may be well, therefore, to note, for the information of my Ceylon readers, that this species is dusky lavender-grey on the back, with the head grey and the feathers of that part and the hind neck attenuated; primaries blackish, tipped with grey; lower parts in the male chestnut, and the terminal portions of the four outer tail-feathers deeper in hue than the belly; wing 3·95 to 4·1 inches. The female is paler beneath.

Sturnia nemoricola, Jerdon, from Burmah and Tenasserim, is allied to the last-named species; the under surface in the male is as pale as that of the female in *S. malabarica*, and the winglet and primary-coverts are more or less white.

Distribution.—This pretty bird is not very well known in Ceylon, being confined to the dry parts of the island, in which it is somewhat local. Layard found it at Point Pedro, and remarks that it is not uncommon in the north; from that part southwards as far as Chilaw it occurs at various localities; on the east coast it is not uncommon. Kelaart mentions it as being found at Trincomalie, and in that district I have met with considerable flocks in localities between Tirai and the port; to the south of the Bay of Kottiar it occurs about the Virgel, and in the Batticaloa district is not uncommon, frequenting the lowlands around the Kalmuni Lake. Thence southwards I have no doubt it is found where the sea-board tract of country is favourable to its habits; and in the Hambantota district I can speak from experience as to its being numerous, although even there it appears to restrict itself to particular places. I found large flocks of it between Kirinde and Yāla. I am not aware that it inhabits the interior, as I have never met with it many miles from the sea-shore.

On the mainland it is by no means restricted to maritime districts, occurring throughout the Indian peninsula, particularly where there are temples and other large buildings. It is, however, found in Ramisserum Island and on the coast of the Carnatic, in parts of which territory it is abundant; but Jerdon remarks that it is rare on the Malabar sea-board. The Rev. Dr. Fairbank records it from the base and "well up the sides" of the Palanis, and remarks that it is everywhere found in the Khandala district; Messrs. Davidson and Wender likewise record it from the Deccan, and say that it breeds at Satara. Its range extends far towards the north-west, for it is found in the Mount Aboo, Guzerat, and Sambhur-Lake districts, and has lately been procured at Trainhee in Sindh; in Kattiawar and about Kutch it is scarce. Turning, however, towards the east we find that, according to Mr. Ball, it is sparingly though universally distributed throughout Chota Nagpur, being more plentiful in Sirguja than elsewhere. In his list of the birds found between the Ganges and Godaveri rivers he cites the Rajmehal hills, Manbhum, Lohardugga, Sambalpur, Orissa north and south of the Mahanadi river, Nowagarh, and Karial as places in which he found it; to which Mr. Hume adds Raipur. In the N.W. Provinces it is a common resident, and to Lower Bengal it is a casual visitor at the end of the hot season, being, as Blyth says, often procurable from Calcutta bird-catchers. In the lower regions of Nepal and Cashmere, and also in the lesser ranges of the latter province, it is likewise, according to Jerdon, found. In Burmah it is replaced by *S. burmanica* and *S. nemoricola*; but Jerdon states that it is found in Assam and Arrakan, whether correctly or not I am unable to say, as the above-mentioned species, together with *S. malabarica*, are the only members of the genus recorded in 'Stray Feathers' from that side of the bay.

Habits.—The Brahminy Myna frequents open bushy plains, bare fields, low scrubs, clearings in the jungle, &c. It feeds on the ground, associating in moderately sized flocks, which alight on the tops of bushes or small trees when disturbed. They are wary birds and difficult to approach, flying on before their pursuers from bush to bush. In Ceylon I never saw it in company with the *Acridotheres* about cattle; but in India it is said to have this habit. In fact with us it frequents the dry arid portions of the country, where the Common Field-Myna is not very common. I have found its food to consist chiefly of insects and Coleoptera of various kinds; but it also feeds on seeds, buds, and small fruits. Its ordinary note is a rather mellow whistling call, which it utters both on the wing and when feeding in company. It has a strong straight flight, and flies in closely packed little flocks, which, when going home to roost, settle on the tops of trees, rest awhile, and then take wing again. It roosts in the foliage of low shady trees, retiring early.

In Lower Bengal Blyth says that at the end of the cold season it frequents the arboreal cotton-trees, feeding on the insects which are attracted to their flowers; in Cashmere it is said by Adams to eat the seeds and buds of pines; while in Madras, as above noticed, it has the habit of feeding on the ground among cattle

in company with the Common Myna, picking up grasshoppers and other insects. Jerdon remarks that it has a variety of calls and a rather pleasing song, and that it is frequently caged and domesticated, imitating any other bird placed near it.

Nidification.—In the northern parts of Ceylon this Myna breeds in July and August, and nests, I am informed, in holes of trees; the same is the case in Northern India; but in Madras it is said by Jerdon to build about large buildings, pagodas, houses, &c., although some correspondents of Mr. Hume testify to its preferring trees to these latter situations. Mr. Blewitt, an experienced Indian oologist, has found the nest in mango-, tamarind-, and jamun-trees from May until July, and says that feathers, grass, and sometimes an odd piece of rag are loosely placed on the bottom of the hole for the eggs to repose on. The eggs are smaller than those of the Common Myna and very pale in colour, varying from "bluish white to pale blue or greenish blue;" they average in size, according to Mr. Hume, 0·97 inch in length by 0·75 inch in breadth.

Subgenus STURNORNIS.

Bill larger, longer, and less compressed than in *Sturnia*; the culmen straighter; under mandible stout. Tail longer in proportion to the wings, with the under tail-coverts less lengthened than in *Sturnia*; 2nd quill considerably shorter than the 3rd, which is the longest.

STURNORNIS SENEX.

(THE WHITE-HEADED STARLING.)

(Peculiar to Ceylon.)

Pastor senex, Bonap. Consp. Av. p. 419 (1850) (*ex* Temm. Mus. Lugd.).
Hetærornis albofrontata, Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 217.
Temenuchus albofrontatus (Lay.), Blyth, Ibis, 1867, p. 299.
Temenuchus senex (Temm.), Gray, Hand-l. B. ii. p. 20. n. 6296 (1870); Holdsworth, P. Z. S. 1872, p. 462; Legge, Ibis, 1874, p. 23.

Ad. suprà schistascenti-griseus, vix metallice virescenti nitens: colli postici plumis conspicuè albo medialiter lineatis: alis caudaque nigris metallicè viridi nitentibus: fronte et vertice ut et facie laterali totâ gulâque purè albis: pileo postico dorso concolori, plumis ad basin albo mixtis: corpore reliquo subtùs cinerascente, scapis plumarum linealiter albis: subcaudalibus cinerascenti-albis: subalaribus et axillaribus nigricantibus, illarum scapis albidis: remigibus subtùs nigricantibus, intùs brunnescentioribus: rostro cærulescenti-corneo, ad basin et ad rictum cærulescentioribus: pedibus plumbescenti-cæruleis: palpebrâ cærulescente: iride albâ.

Adult male. Length 8·3 to 8·5 inches; wing 4·25 to 4·4, expanse 13·1; tail 3·0 to 3·1; tarsus 1·0 to 1·1; middle toe and claw 1·0; hind toe and claw 0·7; bill to gape 1·05 to 1·15.

Adult female. Length 8·2 inches; wing 4·25.

Iris dull whitish, with a narrow brown inner circle; orbital skin and eyelid dull bluish; bill, gape, and base plumbeous blue, the apical half pale bluish brown; legs and feet bluish plumbeous, claws bluish.

Forehead, front of crown, face, chin, throat, and under tail-coverts white, dullest on the latter part: centre of crown, nape, hind neck, back, wings, and tail black, with a greenish lustre; the edges of the back-feathers in some perceptibly ashy, and those of the hind neck with whitish shafts more or less conspicuous according to the amount of white on the head; fore neck, chest, breast, and flanks dusky lavender-grey, paling on the lower part of the breast, and blending into the white of the throat, each with a white mesial stripe; under wing-coverts dull blackish; under surface of quills brown.

Young. Iris brown, with a faint grey outer edge: this increases, and in birds evidently still in the first year the proportions of white and brown in the iris are about equal, the former gradually increasing until it leaves the narrow brown inner circle; bill, legs, and feet as in the adult.

In nest-plumage the forehead, head, and hind neck are concolorous and of a dull brown hue; a whitish superciliary stripe passes from the nostrils over the eye; the ear-coverts are sullied white, but the white of the throat seems to extend lower down, and to change abruptly into the dark grey of the chest; the lower parts, however, are not always equally dark; some examples have them pervaded with whitish; but the chief character of the under surface in the immature bird is the absence of the white mesial stripes, contrasting strongly with the grey of the rest of the feathers. The white of the forehead appears during the first year and increases with subsequent moults, which take place in August.

Obs. This species has of late been placed in the genus *Sturnia* (*Temenuchus*); but inasmuch as it differs markedly in the points above indicated, I have placed it in a new subgenus; the feathers of the head and occiput are likewise not so attenuated as in typical *Sturnia*.

The under surface in adults is subject to variation. In some examples the mesial lines are narrow and very clearly defined; in others they blend into the surrounding dark colour. These latter are probably not fully adult.

I have never seen a specimen with the frontal white extending further back than the centre of the crown. In my notes in 'The Ibis,' 1874, I erroneously stated that the female had more white on the head than the male. At that time I had not procured males as old as the specimens of the other sex which had fallen to my gun; afterwards I obtained both sexes in precisely the same plumage. A Ceylon specimen of this species in the Museum of Leyden was named *P. senex* by Temminck; but its habitat was erroneously given by Bonaparte, who first published the title

STURNORNIS SENEX, ad ♀; juv.

in the 'Conspectus Avium,' p. 419, as Bengal—the consequence of which was that Layard, when he obtained it, was not sure that it was referable to Temminck's species, and described it as new, writing as follows :—"It may be *Pastor senex*, Temm., as it agrees tolerably well with the short description given in Prince Bonaparte's Consp. Av. p. 419; but that description is so concise that I cannot be sure of it; I therefore name it provisionally *H. albofrontata*."

Distribution.—This arboreal Starling, which is one of the most interesting of the species peculiar to Ceylon, is very scarce in collections, and has always been looked upon as one of our rarest birds. The fact is, that the portions of the island which it inhabits are wild hill-forests seldom trodden by Europeans, and hence its scarcity in the cabinets of collectors; but nevertheless in these primeval solitudes it is numerous. It is a bird of local distribution, being chiefly confined to the great forests on the Peak range which stretch from the Kuruwite Korale round to Belihul-oya and the upper forests of the southern ranges, including the Singha-Rajah, and other extensive jungles stretching through the northern and lower part of the Kukul Korale into the Pasdun Korale. As regards the latter locality, which is the lowest at which it has yet been observed, I found it in some of the valleys through which the southern affluents of the Kaluganga find their way to the main stream, and not far from the remote village of Moropitiya, at an altitude of a few hundred feet above the sea-level. There appears to be a continuous stretch of hilly forest extending northward of this place for twenty miles to the Kaluganga; and the White-fronted Starling will probably occur throughout this region. Above Gillymally I found it very abundant in forest of about 1200 feet elevation, and equally so 2000 feet higher up. It appears to cross over into some of the western coffee-districts from the Maskeliya jungles, for Mr. Bligh procured it in 1872 in Kotmalie. Layard does not seem to have procured specimens of this bird himself, as he only speaks of it as existing in Mr. Thwaites's collection; and in what part of the hill-zone this latter gentleman procured it I am unable to say. There is a specimen in the British Museum procured by Mr. Boate and labelled Nuwara Eliya. Mr. Bligh tells me he has never seen it in Haputale; but I do not see why it should not extend along the entire southern base of the Kandyan mountains. It will assuredly be found on the eastern slopes of the Kolonna and Morowak Korales.

Habits.—The White-headed Starling frequents fruit-bearing trees in high forest, cheena- and patna-woods. It is frequently found, too, about the edges of jungle or by the sides of sylvan paths. It is entirely arboreal, never descending to the ground, but feeding sociably in parties in the topmost branches of thickly foliaged trees. It is passionately fond of the wild cinnamon and of the luscious fruit of the Kanda-etta tree. In the Singha-Rajah forest I found it feeding on the berries of a small tree, *Macaranga tomentosa*, which grew in the gorges of the mountains, and likewise searching about Jack-trees near some of the forest hamlets for insects, in the pursuit of which I have also seen it in company with a troop of *Layardia rufescens*. Its powers of voice seem to be somewhat limited, as I never heard it utter any note but a quick Starling-like chirp, which it is particularly given to when assembled in flocks. While feeding it is not at all shy; and so intent is it on devouring the berries and fruits of its choice that a number may be shot one after the other in the same tree. Mr. Bligh noticed that it was fond of mulberries, coming into the garden attached to his bungalow in Kotmalie in search of them. When encamped in the Peak forest during the month of August I noticed that this bird roamed about the patnas towards evening, flying in small parties of half a dozen or more; it was then very shy, settling on the tops of dead trees and keeping up a quick chirping until it took wing on my approach.

I regret to say that nothing is known of the nidification of this bird.

The figures of this bird in the Plate accompanying the present article are those of an adult female shot in the Singha-Rajah forest, and a young bird procured in the Gillymally jungles.

Genus EULABES*.

Bill very stout, deep at the base, the gape without the rictal curve of the members of the preceding genera; the culmen well curved, the under mandible slightly broader than the upper at the base; nostrils basal, rather small and round, placed in a depression. Wings long, the 3rd and 4th quills the longest. Tail short and even. Legs and feet very stout, and covered with strong transverse scutes; tarsus longer than the middle toe. Claws much curved.

Head adorned with naked skin and wattles of a yellow colour.

EULABES RELIGIOSA.

(THE SOUTHERN BLACK MYNA.)

Gracula religiosa, Linn. Syst. Nat. i. p. 164 (1766); Jerdon, Cat. B. S. India, Madr. Journ. 1840, xi. p. 24; Blyth, Cat. B. Mus. A. S. B. p. 108 (1849); Kelaart, Prodromus, Cat. p. 125 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 216; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 522 (1856).

Eulabes religiosa, Jerdon, B. of Ind. ii. p. 337 (1863); Blyth, Ibis, 1867, p. 40; Holdsw. P. Z. S. 1872, p. 463; Hume, Nests and Eggs, ii. p. 435 (1874); Legge, Ibis, 1874, p. 23; Fairbank, Str. Feath. 1877, p. 407; Ball, ibid. 1878, vii. p. 221.

Gracula minor, Jerdon, Cat. B. S. India, Madr. Journ. 1844, xiii. p. 134.

The Minor, Edwards, Birds, pl. 17; *The Jungle-Grackle*, *The Jungle-Myna*, *The Southern Hill-Myna* (Jerdon); *The Black Myna*, or *Glossy Myna*, in the south of India. *Kokni-maina*, Hind.; *Konda gorinka*, Telugu (Jerdon).

Selalaheniya, Southern Province; *Halalaheniya*, Northern Province, Sinhalese.

Adult male and female. Length 9·5 to 10·25 inches; wing 5·7 to 5·8; tail 2·7 to 3·0; tarsus 1·2 to 1·25; middle toe and claw 1·4; hind toe from base 0·7; bill to gape 1·4.

Iris brown, the outer edge white, darkly mottled; bill orange-yellow; legs and feet citron-yellow; lappets and cheek-spot rich yellow, the latter tinged with blue at the upper edge.

The wattles or ornamentation of the head consist of a naked yellow patch on the cheek, a similar stripe running from the eye to the side of the nape, where it expands into a broad lappet, running forward again at each side of the occiput to the top of the head in a narrow "plaited" stripe.

Entire plumage glossy black, with strong metallic reflections of rich purple on the head, cheeks and hind neck, and on the rest of the upper surface and throat with green; wing-coverts and lower parts margined with green; chest and sides of breast margined with bronze and purple; primaries with a white bar across the middle, commencing on the inner web of the 2nd, and ending on the outer web of the 8th.

Young. These have the flaps slightly developed; they are very short, and with the rest of the lappet are of a dull yellow;

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* The Grackles or Glossy Mynas, together with some allied genera, differ in their stout curved bills, unangulated gape, and metallic plumage from the true Mynas and Starlings, and are grouped by most systematists in a distinct subfamily. They constitute the Lamprotorninæ of Jerdon. Ornithologists, however, do not agree as to the various Asiatic and African genera which fall within the limits of the subfamily, and it is not necessary in this work to adopt it. The Lamprotorninæ appear, as Jerdon remarks, to grade into the Starlings through the genus *Calornis*; and the aberrant *Saraglossa spiloptera* (the Spotted-winged Starling), which has been placed in this subfamily, does not appear to belong to it.

the coronal stripes are not fluted, as in the adult, and the cheek-patch is very small. The reflections of the plumage are duller than those of mature birds, and the belly is edged with greyish.

Obs. The dimensions given of a pair of Southern Indian examples (Str. Feath. 1877, p. 407) are:— ♂, length 10·0 inches, expanse 18·0, wing 5·8, tail 3·0, tarsus 1·2, bill from gape 1·4; ♀, length 10·0, wing 5·6, expanse 17·6, tail 3·0, tarsus 1·2, bill from gape 1·4. The iris of the male is recorded as brown, fading out into grey. The wing of a male from Travancore is given at 5·56 inches. Specimens which I have examined from Malabar vary in the wing from 5·3 to 5·5 inches.

This species is closely allied to the Central-Indian Myna, *E. intermedia*, and its allies *E. javanensis* and *E. andamanensis*. These three races are in themselves so closely allied that Mr. Hume states he is scarcely able to draw the line between them when a large series is taken into consideration, and, indeed, as regards the last-named, he recently remarks (Str. Feath. 1878, p. 398, B. of Tenass.) that he would not separate it from *E. javanensis*. *E. intermedia* and its allies, however, differ materially from the present species in having no naked cheek-patch, and in not possessing the narrow loose fold running forward on the head on each side of the occiput. It has likewise a larger bill. It replaces the Ceylon and South-Indian bird in Chota Nagpur, Sambalpur, and Raipur. The Malaccan bird, *E. javanensis*, has a larger bill than *E. intermedia*, and the Andaman race a slenderer one than the Malaccan. Examples of *E. javanensis* in the national collection measure in the bill, from tip to gape 1·4 to 1·55 inch, and in height at the nostril 0·55 to 0·6; in *E. andamanensis* the height of the bill is barely 0·5 inch.

Distribution.—The Southern Hill-Myna is a bird of local distribution in Ceylon, being confined to particular forests, the banks of certain rivers, and the neighbourhood of tanks in the Eastern Province. It is numerous on the hilly banks of the Gindurah, and in the forests of the south-western hill-district between that river and Matara; likewise in the Pasdun Korale and on the banks of the Kaluganga; also in various parts of the Western Province, such as Panadure, the forests of the Hewagam Korale (particularly the Ikadde-Barawe jungle), those of the Rayigam Korale, and the wooded ranges between Avisawella and Kurunegala. In the Eastern Province I found it plentiful in the Nilgalla district and in the forests on the Friars-Hood group of hills. Layard speaks of it as being common at Puttalam, and says that it extends sparingly into the Kandyan province. Mr. Parker writes me that it is found in forest near Uswewa. Its distribution is somewhat affected by the presence of open country adjoining heavy jungle, which latter it avoids when it is unbroken; this character is exemplified in its haunting the vicinity of tanks, and was particularly noticeable to me on the occasion of a trip from Ratnapura to Kalatura: in the heavy forest in the centre of the Pasdun Korale it was not seen; but directly the partly open country between the villages of Moropitiya and Baduleriya was reached the Black Myna made its appearance.

I have not observed it above an altitude of 1500 feet, up to which I have found it ranging in the Balacadua and Lunugalla passes, and likewise in the Peak forests near Gillymally.

In Southern India, where this species is common, it appears to be more essentially a hill-bird, ranging into the hills to a much higher elevation than in Ceylon. The Rev. Dr. Fairbank, for instance, records it as being obtained by him between 1000 and 5000 feet in the Palani hills; and in the Travancore hills Mr. Bourdillon says it is one of the commonest of birds, being found in equal numbers at all elevations. It is not recorded from the Deccan or from the Khandala district; but Jerdon says it is found in the forests of the northern circars as far as Gumsur, extending west into the wooded portion of the Nagpore territories. Mr. Ball likewise notes it from Gumsur and the northern circars. It is, according to Jerdon, most abundant in the Ghâts, the Wynaad, Coorg, and other elevated districts up to 3000 feet or so.

Habits.—This showy bird frequents high jungle and forest, being especially fond of the vicinity of rivers, and likewise of open clearings in the woods which are studded with tall dead trees. In the Pasdun Korale, between the Maguru ganga and Kalatura, where it is common, it is found about native villages situated in wooded knolls, and affects the kitool-palms there more than other trees. Like the next species, it has a habit of launching itself out into the air with a shrill whistle and returning to its perch. Its note is higher than that of the Hill-Myna and more metallic-sounding. It is caught and kept as a caged bird by the natives in parts of the western and southern provinces, and is said by them to talk well. It usually associates in pairs, except when feeding on the fruit of some favourite tree, when I have found it in small parties. It is not a

shy bird, having very little fear of a gun-shot; indeed I have shot several out of the same tree without any member of the little party taking flight. It feeds on various berries and fruits, which it swallows whole. Jerdon testifies to the same local propensity which I have observed to obtain with it in Ceylon; he says:—"It seems partially distributed, as you may pass through miles of forest without seeing a single specimen. It is generally found in small parties of five or six, frequenting the tops of the loftiest trees, and feeding on fruit and berries of various kinds. I never found that insects had formed any portion of its food. The song of this bird is very rich, varied, and pleasing . . . . it is not often seen in cages in India; but it is very highly prized both for its powers of song and speech, which are said to surpass those of all other birds in distinctness. It has probably been from erroneous information that this species was named '*religiosa*' by Linnæus, as I am not aware of its being considered sacred by the Hindoos." Elsewhere ('Birds of India') he suggests that the great Swedish naturalist probably confounded it with *Acridotheres tristis*, a bird attired in "sad-coloured" plumage, and was thus led to apply to it its inappropriate title.

Nidification.—The Black Myna was breeding on the Pasdun Korale on the occasion of a visit I made to that part in August; but I did not procure its eggs. It builds in holes made by Barbets and Woodpeckers in soft-wood trees, and is said not to lay its eggs on the bare wood, but to line the bottom of the cavity with grasses, roots, feathers, &c. Mr. Bourdillon writes that in Southern India it makes its nest of straw and feathers in a hole a considerable height from the ground. The eggs are described as "very gracefully elongated ovals;" the shell is smooth and fine, with a rather faint gloss; ground-colour greenish blue, more or less profusely spotted or "splashed" with purplish, chocolate-brown, and very pale purple. Dimensions 1·35 to 1·37 inch in length by 0·87 to 0·9 inch in breadth.

[illegible] ACRIDOTHERES MELANOSTERNUS

EULABES PTILOGENYS.

(THE CEYLON MYNA.)

(Peculiar to Ceylon.)

Gracula ptilogenys, Blyth, J. A. S. B. 1846, xv. p. 285; id. Cat. B. Mus. A. S. B. p. 108 (1849); Kelaart, Prodromus, Cat. p. 125 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiii. p. 216.

Eulabes ptilogenys, Blyth, Ibis, 1867, p. 299; Holdsw. P. Z. S. 1872, p. 463; Legge, Ibis, 1874, p. 25.

Dr. Templeton's Myna, Kelaart; *The Black Myna* in the planting districts.

Mal-kawada, Sinhalese, Saffragam; *Selalaheniya* of the Kandyans.

Ad. suprà viridescenti-niger, purpureo varius: pileo et facie laterali velutinis nigris: corpore subtùs toto viridescenti-nigro, pectore magis purpurascente: alis caudâque nigris viridi vel purpureo extùs lavatis, primariis 2°–7^{mum} albo notatis fasciam alarem conspicuam formantibus, primario secundo intùs tantum notato: rostro aurantiaco, ad basin nigro: pedibus pallidè flavis: iride albâ: carunculis flavis.

Adult male and female. Length 10·75 to 11·1 inches; wing 5·9 to 6·25; tail 2·5 to 3·0; tarsus 1·3 to 1·4; middle toe 1·1, its claw (straight) 0·4; bill to gape 1·6. Lappets 0·9 inch in length, 0·7 in breadth, springing from each side of the nape, and *meeting at the base* in *old* birds.

Iris (male) greyish white, dappled with brown, (female) white or yellowish white; bill orange-red, with the upper mandible black from gape to nostril, and the lower for nearly half its length; legs and feet gamboge-yellow; claws blackish; lappets rich yellow.

Entire plumage glossy black, with strong metallic reflections of purple on the head, hind neck, upper back, breast, and thighs, and of greenish bronze on the back, wings, and belly; across the wing a white bar, extending from the inner web of the 2nd to the outer web of the 7th quill, and in some specimens only to the 6th.

Young. Birds of the year have the iris quite brown; bill with more black about the base, and not so long as in the adult; lappets smaller and *widely separate* at the base; lower parts faintly edged with greyish. In this stage they breed.

Obs. I record the colour of the iris in the adult female as *white* because I have found it so in all specimens I have shot; I believe Mr. Bligh has observed the same to be the case. Whether the eye of the male becomes white with age I am unable to say; I have always found greyish or brown tints in it, and they are usually in the form of dots or stipplings. The fact of the eye in the young bird being brown augurs strongly in favour of a change eventually to the same colour in both sexes; and it may be that I have not succeeded in getting a fully-aged male. The subject is worthy of consideration at the hands of my readers.

Distribution.—The Ceylon Myna is chiefly confined to the mountains of the Kandyan Province, the southern ranges, and the subsidiary high forests on the south bank of the Gindurah and the northern portions of the Kukul Korale which are continuous with the Singha-Rajah or "Lion-King" forest. On the eastern and southern slopes of the central zone I have never found it below 1500 feet; but this is by no means the case as regards the western slopes lying between Maskeliya and Pelmadulla, through the continuous forests of which it descends into the low country, and spreads over the Three Korales, as well as the Kuruwite and perhaps the adjoining borders of the Rayigam Korales, wherever there is tall forest. It is tolerably common about Avisawella, which is nearly on the level of the sea; and in that neighbourhood I have procured it as far seawards as the twenty-eighth mile-post from Colombo. Mr. C. Byrde, of the Ceylon Civil Service, informs me that it breeds yearly at Avisawella; and I found it nesting myself in the timber-forests of Mr. Charles de Soyza's estate, Kuruwite. In the main range and on the Nuwara-Eliya plateau it is more abundant in the cool season than at other times; but it does not appear ever to cross the Totapella range to the upland of Horton Plains, as I nowhere observed it in the mossy forests of that region.

This Myna, which has always been considered one of the finest of the Passerine forms peculiar to Ceylon, was discovered by Dr. Templeton, and the specimens he obtained were transmitted to Blyth for examination and description. Like the Ceylon Jay, its numbers in the hills have decreased since the districts now planted in coffee have been denuded of their primeval clothing, its chief stronghold at present being the large forests in the main and Peak ranges; and should these be invaded to a great extent by the woodman's axe, the Myna will no doubt betake itself much more to the low country than it has done up to the present time. It is not unlikely that its presence in the low-lying forests at the foot of the Ambegamoa district may be due to the felling of its native forests on those hills. The Blackbird is much oftener seen in open coffee-estates now than a few years back; and it is evident that so great an alteration in the face of nature in the Central Province must needs produce a corresponding change in the habits of many of the birds which frequent it.

Habits.—This handsome bird frequents for the most part the tops of tall trees; it associates in small parties, and is very partial to the sides of deep ravines, lofty precipices, and overhanging woods. It is fond of launching itself out into mid-air from these dizzy heights, uttering its shrill metallic-sounding whistle and loud calls; and circling round, it returns to its lofty perch on the top of some huge Doon-tree, and there continues the exercise of its vocal powers. Its well-known voice consists of a piercing and not unharmonious whistle repeated several times and then followed by a series of loud guttural calls, some of which resemble the syllables *chōōoke, chi-ōōope*; these are, however, only uttered as call-notes while it is perched. The Myna talks well, and is eagerly sought after as a caged bird, and much prized by the Kandyans as a pet, as it is extremely difficult to procure from the nest. It is a restless bird, particularly towards roosting-time; and in forests where it is abundant I have often seen it roaming about in small parties, dashing down the gloomy gullies, and sweeping backwards and forwards with frequent rapid descents, which cause a loud rustling sound. After alighting on the tallest tree to be found, these restless parties indulge in sundry piercing whistles, and then start off again on their peregrinations until a suitable spot for their night's quarters, in the foliage of some vast tree, is found.

In its habits it is, like the rest of the Grackles, entirely arboreal, and its diet is frugivorous. Among the many fruits to be found in the forests of Ceylon there are none of which it is so fond as the wild cinnamon and the nutmeg. The latter they swallow whole, digesting the mace from the exterior of the nut, which they afterwards reject. The habit ascribed by Layard to this species of frequenting pastures and perching on the backs of cattle probably appertains to the Common Myna (*Acridotheres melanosternus*), for it is essentially an arboreal bird and does not descend to the ground at all.

Nidification.—This species breeds in June, July, and August, laying its eggs in a hole in a rotten tree, or in one which has been previously excavated by the Yellow-fronted Barbet or Red Woodpecker. It often nests in the sugar- or kitool-palm, and in one of these trees in the Peak forest I took its eggs in the month of August. There was an absence of all nest or lining at the bottom of the hole, the eggs, which were two in number, being deposited on the bare wood. The female was sitting at the time, and was being brought fruit and berries by the male bird. While the eggs were being taken the birds flew round repeatedly, and settled on an adjacent tree, keeping up a loud whistling. The eggs are obtuse-ended ovals, of a pale greenish-blue ground-colour (one being much paler than the other), sparingly spotted with large and small spots of lilac-grey, and blotched over this with a few neutral brown and sepia blots. They measure from 1·3 to 1·32 inch in length by 0·96 to 0·99 in breadth.

The figure in the Plate accompanying this article is that of a low-country female bird shot in the Kuruwite Korale.

PASSERES.

Series D. Formicarioid Passeres.

Wing with 10 *primaries, the first well developed and typically long.*
(*Cf.* Wallace, Ibis, 1874, p. 413.)

Fam. PITTIDÆ.

Bill moderately stout and straight, notched at the tip; gape smooth. Wings very ample, proportionately long, with the secondaries lengthened. Tail of 12 feathers, very short, scarcely exceeding the tarsus; under tail-coverts lengthened. Tarsus long.

Of terrestrial habit.

Genus PITTA.

With the characters of the family. Bill scarcely compressed; gonys somewhat deep; nostrils oval and oblique, exposed; culmen keeled and greatly curved to the tip. Wings with the 2nd, 3rd, and 4th quills nearly equal; the 3rd usually the longest; the 1st shorter than the 5th. Tail rounded. Tarsus longer than the middle toe and claw, shielded in front with wide, smooth, transverse scales; toes short, middle toe considerably exceeding the lateral ones, of which the outer is the longer; hind toe rather long, its claw curved.

PITTA CORONATA.

(THE INDIAN PITTA.)

Turdus coronatus, P. L. S. Müller, Natursyst. Anhang, p. 144 (1766).
Corvus brachyurus, var. *bengalensis*, Gmelin, Syst. Nat. i. p. 376 (1788).
Turdus triostegus, Sparrm. Mus. Carls. fasc. iv. pl. 84 (1788).
Pitta brachyura, Gould, Cent. Him. Birds, pl. 23 (1832); Jerdon, Cat. B. S. India, Madr. Journ. 1839, x. p. 251; Kelaart, Prodromus, Cat. p. 122 (1852); Layard, Ann. & Mag. Nat. Hist. 1853, xii. p. 269; Holdsw. P. Z. S. 1872, p. 445; Ball, Str. Feath. 1878, vii. p. 213.
Pitta triostegus (Sparrm.), Blyth, Cat. B. Mus. A. S. B. p. 157 (1849).
Pitta bengalensis (Gm.), Horsf. & Moore, Cat. B. Mus. E. I. Co. i. p. 184 (1854); Jerdon, B. of Ind. i. p. 503 (1862); id. Ibis, 1872, p. 133.
Brachyurus bengalensis (Gm.), Elliot, Mon. Pittidæ, pl. iv. (1863).
Brachyurus coronatus (Müller), Elliot, Ibis, 1870, p. 414.
Pitta coronata, Hume, Nests and Eggs, p. 224 (1873); Ball, Str. Feath. 1874, p. 406;

Butler & Hume, ibid. 1875, p. 470; Fairbank, ibid. 1876, p. 257; Ball, ibid. 1877, p. 416.

Madras Jay, Ray; *Bengal Quail*, Albin; *Short-tailed Pye*, Edwards, Birds, pl. 324; *Ant-Thrush*, *Painted Thrush* of Europeans; *The Indian Ground-Thrush*, *Yellow-breasted Ground-Thrush* of Indian writers. *Nourang*, lit. "Nine-coloured bird," Hind.; *Shumcha*, Beng.; *Pona inki*, Telugu; *Tota-collan*, lit. "Garden Thief," Tamil, *apud* Layard; *Ara Mani kuruvi*, Coolies on coffee-estates (lit. "Six o'clock bird").

Avitchia, Sinhalese (from its cry); *Ayittā*, N.W. Province.

Adult male and female. Length 6·5 to 7·0 inches; wing 4·1 to 4·2; tail 1·5 to 1·7; tarsus 1·35 to 1·45; middle toe and claw 1·1; hind toe and claw 0·7; bill to gape 1·05 to 1·1.

Iris brown, variable in depth; bill orange-reddish along the ridge and on basal half of lower mandible, with the sides of both mandibles towards the tip dusky brown; legs and feet flesh-colour or pale reddish grey; toes in some specimens brownish at the joints.

Lores, cheeks, hind neck, back of head, and a broad stripe running forward to the forehead and skirting the nostril, primaries, secondaries, the inner webs of tertials, primary and under wing-coverts, under surface of wings and tail black; chin, throat, a patch below the eye, and a superciliary stripe white, the latter is surmounted by a broad band of yellowish brown commencing at the nostril and running back with it to the back of the neck, where they both overlie the black feathers; a white band across the quills commencing on the inner web of 1st primary and ending on the outer web of the 7th; tips of the primaries smoky grey, those of the secondaries white, the outer portion of the latter feathers and the terminal parts of the greater wing-coverts greenish blue; median wing-coverts, outer webs and tips of tertials, scapulars, and back leaf-green; the back more or less washed with brownish on its upper part; least wing-coverts and upper tail-coverts brilliant turquoise-blue; tips of tail-feathers greenish blue; beneath from the throat fawn-colour, the flanks somewhat dusky; lower part of belly, vent, and under tail-coverts scarlet.

Obs. Some females appear to have the scarlet less bright than the males, and the back shaded with brown. Variations, however, occur in the plumage of both sexes, probably dependent on age, and consist in the greater or less breadth of the white wing-bar, in the brilliancy of the upper tail-coverts, and in the amount of white at the tips of the secondaries. Some examples, which appear to be immature, have the white feathers at the side of the throat tipped with brownish.

Indian specimens I have examined are similar in size and colouring to those which visit Ceylon. An example, however, from Nepal measures 4·5 inches in the wing, being somewhat larger than our birds. There are some allied species in the green-backed, fulvous-breasted group to which our bird belongs, and among them *P. oreas*, Swinh., from Formosa, is, according to Elliot, the nearest to *P. coronata*. It is distinguished from this latter by having the crown dull reddish brown and the under wing-coverts jet-black, "without any trace of the white feathers which form so conspicuous a mark in its ally": wing 5·0 inches. *Pitta moluccensis*, Müller, from the countries on the east of the Bay of Bengal, likewise belongs to this group; but is a handsomer bird, having the beautiful lazuline-blue wing and upper tail-covert patches larger, the brown of the head is darker, and the black of the face runs past the gape upon the chin: wing 4·7 to 4·8 inches. *Pitta megarhyncha*, Schlegel, is allied to the last, and inhabits likewise the province of Tenasserim. I have not had the opportunity of examining specimens; but Elliot remarks that, in addition to having a black bill, "the reddish brown of the head extends to the nape without being broken by a black bar."

Another group of Pittas is characterized by their green under surface, and another (*Melanopitta*) by having portions of the plumage, especially the head and throat, black, to which latter Mr. Hume's beautiful new species, *P. gurneyi*, from Tenasserim, appears to belong.

This singular group of birds, characterized by a more beautiful plumage than is to be found in any series of Passerine birds, save perhaps the Sun-birds, is essentially a Malayo-Asian family. Mr. Elliot, in his synopsis of the family (Ibis, 1870, p. 408), gives a list of 32 species as then known to or recognized by him. Subsequently others have been described, and some which he combined together under one title are now found to be distinct from one another. The following table will show what a large proportion of species is found in the Malay archipelago:—

MALAY ARCHIPELAGO.

Pitta maxima, Forst. (Gilolo).
P. megarhyncha, Schleg. (Banka).
P. concinna, Gould (Lombok, Sumbawa, Flores).
P. irena, Temm. (Timor, Sula Islands).
P. venusta, Temm. (Sumatra).
P. celebensis, Forsten (Celebes).
P. rubrinucha, Wallace (Bouru).
P. rufiventris, Cab. & Heine (Gilolo, Batchian).
P. cyanonota, Gray (Ternate).
P. baudi, S. Müller (Borneo).
P. forsteni, Elliot (Celebes).
P. novæ-guineæ, Müll. & Schleg. (N. Guinea).
P. bankana, Schleg. (Banka).
P. guiana, P. L. Müller (Java).
P. schwaneri, Temm. (Borneo).
P. mülleri, Bp. (Borneo).
P. sanghirana, Schleg. (Sanghir Islands).
P. rosenbergi, Schleg. (Soek).
P. ussheri, Sharpe (Borneo).
P. arcuata, Gould (Borneo).
P. mayforeana, Schlegel (Mayfor Island).
P. cæruleitorquata, Salvadori (Sanghir Islands).

PHILIPPINES.

P. erythrogastra, Temm.
P. sordida, P. L. Müller.
P. steeri, Sharpe.

MALAY ARCHIPELAGO, MALAYO-CHINESE REGION, AND AUSTRALIA.

Pitta oreas, Swinh. (Formosa, Borneo).
P. moluccensis, P. L. Müller (Malacca, Amoy, Siam, Java, Sumatra, Borneo).
P. vigorsi, Elliot (Banda Islands, Australia).
P. granatina, Temm. (Malacca, Borneo).
P. mackloti, S. Müller (Papua, Australia).
P. boschi, S. Müller (Sumatra, Malacca).

INDO-MALACCAN REGION.

P. cærulea, Raffles (Sumatra).
P. nepalensis Hodgs. (Nepal).
P. coronata (India, Ceylon).
P. gurneyi, Hume (Tenasserim).
P. davisoni, Hume (Tenasserim).
P. cucullata, Elliot (Malacca, Nepal, Assam).
P. cyanea, Blyth (Arrakan).
P. oatesi, Hume (Tenasserim).
Anthocincla phayrei, Blyth (Burmah, Tenasserim).

AUSTRALIA.

P. strepitans, Temm.
P. iris, Gould.

JAPAN AND CHINA.

P. nympha, Temm.

AFRICA.

P. angolensis, Hartl. (Sierra Leone).

The Sanghir-Island species, *P. sanghirana*, and the Bornean, *P. mülleri*, were united by Elliot with *P. sordida*, from the Philippine Islands. Salvadori, however, considers that the Bornean bird is distinct; and the Sanghir-Island Pitta has, I believe, lately been figured (Rowley, Orn. Misc. vol. ii. p. 329, pl. lxv.) as distinct. I have therefore included these two species in the Malayan list; and among the Indian members I have placed the remarkable horned "Ground-Thrush" or Pitta (*A. phayrei*).

Space has been devoted to this list in order to give my readers in Ceylon who may be interested in this beautiful genus some idea of its distribution. It is probable that I may have omitted some recently described species from among the 44 here enumerated; but I may mention that Mr. Gould is about to publish a monograph of the Pittas, which will, doubtless, contain every known species properly discriminated.

Distribution.—The Indian Pitta is a cool-season visitant to Ceylon. It arrives about the same time as the Snipe, or perhaps, on the whole, a little later, for it is not very numerous before the first or second week in October. During that month it arrives in vast numbers in the island, occupying almost every little copse and grove as well as all the forests in the low country, while it is spread throughout all the jungles of the Central Province up to the Nuwara-Eliya plateau, where, however, it is not nearly so numerous as at 3000 feet lower down; and at the Horton Plains I did not hear it at all during my visit in 1877. Mr. Holdsworth remarks that he has heard it more than once in August at Nuwara Eliya; so that individuals remain throughout the year at that elevation, and perhaps breed, as they do in many parts of India. I have never myself met with it between the months of May and October; and it is very certain that by the beginning of the former month it has entirely left the low country on its northward migration. Mr. Bligh writes me, in 1876, from Haputale:—"They arrived in October this year in large numbers; they rarely come up so high as this (4500 feet), though I have flushed them at over 5000 feet; but I never heard one call at so high

an elevation in this district. On the other hand, if I step down to a friend's 1500 feet below me, at 6 o'clock their peculiar cry (like attempting to whistle the words 'quite clear' in a moderately high key) can be heard on all sides calling each other to roost." This Pitta is very abundant throughout the northern forest tract; and near Trincomalie they may be heard everywhere, even close to the sea-beach where the shore is lined with scrub. Its well-known cry I have often listened to in the woods just beyond the cinnamon-gardens; and throughout the Western Province it is very numerous; but I do not think its numbers are so great in the south-western wooded districts, as there is a considerable quantity of humid timber-forest in that part, and which is the only kind of country that I have noticed it avoid.

Jerdon remarks of its distribution in India as follows:—"This prettily-plumaged Thrush is found throughout the whole of India, from the sub-Himalayan range to Cape Comorin; but it is never found on the east side of the Bay of Bengal. . . . . In the Carnatic it chiefly occurs in the beginning of the hot weather when the land-winds first begin to blow with violence from the west; and the birds, in many instances, appear to have been blown by the strong wind from the Eastern Ghâts, for, being birds of feeble flight, they are unable to contend against the strength of the wind."

These remarks tend to show that there is a seasonal movement of this Pitta; but in this case it is noted as from west to east. Its migration to and from Ceylon, however, shows that the chief movement is from north to south and *vice versâ*; they avoid the cold climate of Northern India and the Central Provinces; and when this is over, about May, great numbers have been observed to move towards those districts from Southern India and Ceylon. Mr. Hume thus dwells upon its migrations (Str. Feath. 1877, p. 416) in connexion with a remark of Mr. Ball's concerning its movements from the south to the Central Provinces:—"In regard to the present species I may remark that the migration extends much further than the Central Provinces. They arrive in Bareilly about the beginning of the rains, sometimes earlier; in the Dhoon they become very common early in the hot weather. In this latter place some few may be permanent residents, but the great bulk of the birds are migrants from the south. To the Berars and to the forests about Hoshungabad it is a regular migrant. It straggles up even into the semi-desert country of Kattiawar, Northern Guzerat, and the Sambhur Lake. It comes up in numbers to the northern districts of Oudh and Behar. I have caught a specimen in my house at Chowringee, Calcutta, in May. Throughout the length and breadth of the country it moves, during April, May, and June, from the extreme south to all suitable localities in the north (at any rate west of the Brahmapootra), great numbers reaching the bases of the Himalayas or sub-Himalayan ranges."

The Rev. Dr. Fairbank speaks of having seen three in the city of Ahmednagar, and says that numbers arrive in the Khandala district in May. Mr. Ball met with it in sâl-forest in Gangpur, and records it from many places between the Ganges and the Godaveri, but not from the Rajmehal hills. It is, as has been already remarked, only a straggler into the north-western parts of India. Captain Butler considers it very rare about Mount Aboo; and Mr. Adam only notes a single specimen obtained near the Sambhur Lake.

Habits.—This handsome bird, so well known to the Singhalese as the "Avitchia," is, almost more than any other migratory bird to Ceylon, a denizen of thick cover. It rarely shows itself in the open; and those who do not take particular pains to make its acquaintance might listen to its familiar evening cry, season after season, without ever seeing it. It especially loves copses, thick woods, underwood, and overgrown waste land, and in forest districts is usually found where the timber has been cleared and secondary jungle has grown up. Nevertheless while wandering about in tolerably open forest anywhere north of Kurunegala I have frequently seen it and flushed it near pathways; and in damp muggy weather, or on very cloudy days, listened to its strange cry all day long, and over and over again seen it fly to the low limb of a large tree, where it would sit for an instant cocking its tail up with a quick Rail-like movement, and then dart off into the surrounding cover. More than two are, I should say, scarcely ever seen together, and it is a rare thing to find even two in close proximity. They utter their cry in the morning until about 8 o'clock, and commence it again as the sun is nearing the horizon, becoming most noisy at sundown. At this time, when calling to each other, they fly about in search of roosting-places. Their flight is quick and irregular, reminding one of that of the Lapwing, and they dart round the trunks of trees very adroitly. Its note, which I have alluded to, and which Mr. Ball just as aptly renders by the words *whēēt-pe-ŭ*, is preceded often by a shrill churr or call; that is to say, this note is heard usually before the long-drawn cry, this, I imagine, being only uttered as a call-note

when the birds begin to answer one another. Mr. Ball says that when uttering the *wheet* (or, as the Singhalese render it, *avīt*) the head is drawn back as far as possible and then jerked forward again as the bird concludes with the *pe-ŭ*. He has heard it (in the breeding-season I conclude) utter a sweet Thrush-like song resembling that of the *Shâma*.

Though very shy and wary it is possessed of considerable inquisitiveness. While standing still under the shelter of dense jungle I have not unfrequently had it approach me within a few yards, flitting from the ground to a low branch and quietly scanning me with its bright eye, its head cocked on one side and its tail erect. While I remained motionless it would continue to scrutinize me, but on the least stir it would dart off into the surrounding cover.

When it first arrives it wanders into strange places—gardens, compounds, and even houses. Jerdon writes of capturing one in the General Hospital, Madras. My friend Mr. Forbes Laurie related to me that one night, on returning from dining at a friend's, he found one running about among the flowers in his garden at Tunisgala; on bringing a lamp upon the scene he easily caught it. Mr. Bligh, too, informs me that they are frequently caught on coffee-estates in the bungalows on cold stormy days, and that one so captured in his district lived for many weeks, chiefly on worms; it was kept in a lumber-room with only a small window in it and seemed quite happy, standing a good deal on one leg and nervously moving its tail up and down. He tells me that they come some distance to roost, as they are fond of bushy trees like the lime and orange, which are not plentiful on the coffee-estates; and he has seen them making their way across a coffee-plantation by short flights or stages.

It feeds entirely on the ground, picking up beetles, termites, ants, and other insects which it finds in the soil and among dead leaves, its bill being usually covered more or less with earth when it is shot. Layard says that it resorts to the same ant-hill for days together.

I have already referred, in my article on *Turdus spiloptera*, to a Singhalese legend connected with the Pitta; and Mr. Parker sends me the following as bearing on its name (*Ayittā*) in the North-west Province:—"It is said that this bird once possessed the Peacock's plumes; but one day when he was bathing the Peacock stole his dress; ever since that he has gone about the jungle calling for them, 'Ayittam, ayittam' (my dress, my dress).

"Another legend is that the Pitta was formerly a prince who was deeply in love with a beautiful princess. His father sent him to travel for some years, as was in olden times the custom with princes here. When he returned the princess was dead, and the unfortunate prince wandered disconsolately about, continually calling her by name, 'Ayittā, Ayittā.' Out of pity to him, the gods transformed him into this bird."

There is something peculiar, in fact startling, in this bird's curious cry, proceeding from dense thickets, where it cannot itself be seen; and this fact, combined with its beautiful plumage and its sudden appearance in the island as a migrant, which is not intelligible to the untutored native mind, has naturally made it the subject of legends with the Singhalese.

Nidification.—In the Central Provinces of India this Pitta breeds in July and August, according to Mr. Blewitt, who has taken numbers of its eggs. The nests are described by Mr. Hume as "large globular structures, fully 9 inches in horizontal diameter and 6 inches high, with a circular opening on one side; they are composed internally of fine twigs, notably of the tamarisk, and grass-roots; externally of dry leaves, many of them 'skeletons,' held in their places by a few roots or twigs. The internal cavity may be about 4 inches in diameter. The nests are placed in brushwood and scrub-jungle, either on the ground or on low branches close to it."

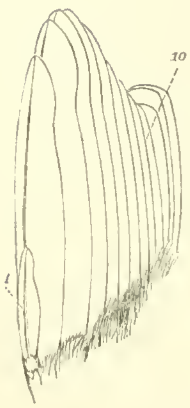
"Few Indian eggs are," says the same author, "more beautiful than those of this species. In shape they are excessively broad and regular ovals; they are excessively glossy; the ground-colour is china-white, sometimes faintly tinged with pink, sometimes creamy, speckled and spotted, and sometimes also painted, with fine hair-like lines of deep maroon, dark purple, and brownish purple as primary markings, and pale inky purple as secondary ones. The primary markings are scattered, in some instances pretty thickly, in others very sparingly, over the whole surface of the egg, but are always much denser towards one end, to which in some eggs they are entirely confined; and here alone the secondary markings are at all conspicuous .... I should note that there is one not uncommon type in which the whole egg is devoid of markings, except

within a broad zone near one end, and even here they only consist of widely scattered and minute specks of maroon and pale lilac."

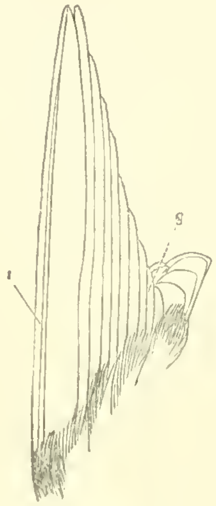
The average size of fifty eggs is recorded as 1·01 by 0·86 inch.

The accompanying woodcuts are intended to illustrate Mr. Wallace's system of classification of the great *Passerine* Order which I have followed in this work.

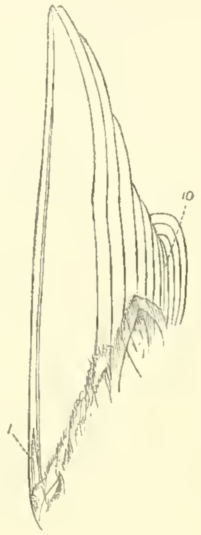
They represent the underside of the wing, so that the 1st quill may be seen to advantage, and are drawn to $\frac{3}{4}$ size.



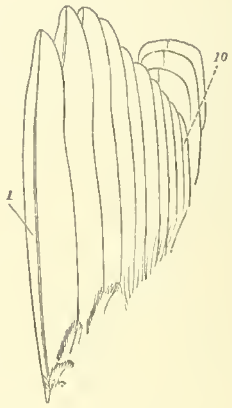
TURDOID PASSERES
(see p. 345).
Wing of *Turdus spiloptera*.



TANAGROID PASSERES
(see p. 574).
Wing of *Hirundo rustica*.



STURNOID PASSERES
(see p. 630).
Wing of *Sturnus vulgaris*.



FORMICARIOID PASSERES
(see p. 687).
Wing of *Pitta coronata*.

PALUMBUS TORRINGTONIÆ

Order COLUMBÆ*.

Bill with the basal half straight and soft, covered with a fleshy skin, in which the nostrils are placed; the tip horny, curved, and vaulted inside; gape wide and smooth. Wings pointed, of 10 feathers. Tail variable in the number of its feathers, usually of 12 or 14, in some 16. Legs short, feathered to the knee; the tarsus fleshy and very stout, scutate in front, except in one genus. Toes stout, flattened beneath, forming a broad sole.

Sternum narrow, with a high keel, and two notches on each side of it in the posterior margin; chest with a large double crop.

Fam. COLUMBIDÆ.

Bill rather narrow, the gape moderately wide, the horny tip less in extent than the fleshy base; nostrils opening to the front. Wings pointed. Tail broad, short, and even in some, long and graduated in others, of 12 feathers. Tarsus somewhat lengthened and not very stout. Toes lengthened; lateral toes subequal; the hallux moderately short.

Of both terrestrial and arboreal habits.

Genus PALUMBUS.

Bill moderately stout, the tip well curved; nostrils placed in a groove and beneath a capacious membrane. Wings with the 3rd quill the largest, and the 1st shorter than the 4th. Tail shorter than the wings, even or rounded at the tip. Tarsus moderately stout, shorter than the middle toe, with transverse scutes in front. Toes rather slender; middle toe lengthened.

PALUMBUS TORRINGTONIÆ.

(THE CEYLON WOOD-PIGEON.)

(Peculiar to Ceylon.)

Palumbus elphinstoni, var., Blyth, J. A. S. B. 1851, xx. p. 178.

Palumbus torringtonii, Kelaart, Prodromus, Faun. Zeylan. p. 107 (1852); Jerdon, B. of Ind. iii. p. 466 (1864); Blyth, Ibis, 1867, p. 306; Hume, Nests and Eggs, iii. p. 499 (1875).

Carpophaga (*Palumbus*) *torringtonii* (Kel.), *C. elphinstonii*, var., apud Blyth, Kelaart, Prodr., Cat. p. 130 (1852).

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* This interesting order of birds is chiefly developed in the great Malayan Archipelago, its focus, as Mr. Wallace, in his able article on the Pigeons (Ibis, 1865), terms it, being in the Austro-Malayan region, comprised of New Guinea, the island of Celebes, and the Solomon Islands. In the article in question it is shown that out of the three hundred and odd species known, no less than 118 (some of these are now united, but, on the other hand, others have since been discovered) inhabit the Malay Archipelago, while on the vast continent of America there are only 80, and in Africa less than 40, Australia possessing 43. Mr. Wallace's remarks on this condition of the distribution of Pigeons are as follows:—"These numbers show that the Malay Archipelago is preeminently the metropolis of the Pigeon tribe. It is now well known, how-

Carpophaga torringtonii (Kel.), Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 59.
Palumbus torringtoniæ (Kel.), Holdsw. P. Z. S. 1872, p. 466; Legge, Ibis, 1874, p. 25.
Lady Torrington's Pigeon, Kelaart; *Blue Pigeon*, *Black Pigeon*, *Wood-Pigeon*, Coffee-planters.
Mila-goya (*goya* being the name for Pigeon), Sinhalese in Central Province; *Mahavillagoya*, apud Layard.

Ad. suprà pulchrè schistaceo-niger: interscapulio lilascenti-vinaceo, dorsi summi plumis vix quoque lilacino adumbratis: tectricibus alarum dorso concoloribus: remigibus brunneis, schistaceo extùs lavatis, secundariis intimis dorso concoloribus, primariis angustè pallidiore brunneo limbatis: capite undique vinaceo, colli postici juguli que plumis viridi nitentibus, illius plumis albo terminaliter maculatis: corpore reliquo subtùs pulchrè lilascenti-vinaceo, subcaudalibus longioribus schistaceo-nigris, reliquis vinaceis ad basin schistaceis: subalaribus et axillaribus schistaceo-nigris: rostro pallidè cærulescente, ad basin plumbescente: pedibus carnescenti-albis, tarso antico rubescente: iride pallidè rubrâ, plagâ orbitali carneâ.

Adult male. Length 13·5 to 14·3 inches; wing 7·7 to 8·0; tail 5·25; tarsus 1·1; middle toe 1·2, its claw (straight) 0·4; bill to gape 1·1.

Iris pale red; orbital skin pink; bill, basal half plumbeous, the apical or corneous portion bluish; tarsus in front and top of the toes red, posterior tarsus and sides of toes with the soles paler; claws fleshy white.

Head, nape, and upper throat vinaceous ashy, paling to albescent on the chin, and passing on the chest and under surface into a more vinous hue, which pales into reddish albescent on the belly, and passes round on the hind neck and upper part of interscapular region into fine reddish bronze, richly illumined with metallic green, the head and fore neck being more faintly illumined with the same; a broad black demi-collar across the hind neck, with white tips to the feathers; rest of upper surface and wings bluish plumbeous, the tail blackish slate and the quills deep brown, with fine light margins to the primaries; under tail-coverts dark cinereous ashy, passing into reddish brown at the tips of the feathers.

Female. Length 13·2 inches; wing 7·2; tail 5·0; tarsus 0·9; bill to gape 1·0.

Legs and feet not so red, with the posterior part of tarsus and sides of toes fleshy white.

Head, chest, and under surface more ruddy than in the male, and the cupreous hue of the lower hind neck deeper; under tail-coverts and flanks redder.

Young. Birds of the year have the iris yellowish grey, with generally a narrower outer ring of pale red (the normal colour of the adult); bill dusky at the tips; legs and feet dull red anteriorly, dusky fleshy behind.

Upper surface ashy plumbeous; forehead and face slightly ruddy; neck-patch not developed, the feathers of the nuchal collar being blackish, with ashy-whitish tips, not pure white; the metallic hues of the hind neck faintly developed; chest ruddy plumbeous; the under surface vinaceous slaty, washed with fulvous-brown on the breast. Some examples have the wing-coverts edged with rusty, and the chin and gorge more albescent than in the adult.

Obs. This fine Pigeon, which was at first considered to be a variety of the Nilghiri Woodchat, *P. elphinstoni*, is closely allied to that species, differing from it merely in the colour of the back, scapulars, and wing-coverts, which are *copper-colour* in the continental form. An example in the British Museum has the head slaty, with a slight bronze tinge; the lower part of the hind neck, the back, scapulars, and wing-coverts are of a bronzed copper-colour: tail not so "slaty" as in *P. torringtoniæ*; throat greyish; chest light slaty, tinged with green; the breast and lower parts iridescent slaty grey, wanting the vinaceous tint of the Ceylon bird; the bill is stouter, and the wing measurement 8·7 and 8·5 inches respectively in two examples which I have measured.

The genus *Palumbus* is a somewhat limited one, comprising in India, besides the two species already noticed, the Himalayan Cushat (*P. casiotis*, Bp.), which is the representative of the European Cushat, and the northern ally of the Nilghiri Wood-Pigeon, *P. pulchricollis*. The latter is a very handsome bird, differing from *P. elphinstoni* chiefly in its brilliantly-coloured neck and also in its redder under surface. The feathers of the neck-patch are rigid, black at the base, changing into reddish, and tipped with white. *P. casiotis* differs from the "Ring-Dove,"

ever, that this part of the world belongs to two distinct zoological regions—the Indian and the Australian; and in these the Pigeons are very unequally distributed; for the western and larger portion (the Indo-Malayan subregion) contains nine genera and forty-three species, while the eastern and smaller portion (The Austro-Malayan subregion) has fifteen genera and eighty-four species. Here, therefore, the species of Pigeons become more condensed and more varied than in any other part of the globe: here is the focus of the order; and it was probably from this part of the world that the original dispersal and modification of the group chiefly took place. This condensation is carried to its greatest height in New Guinea, in which, although only a few points on its coast have been visited, no less than 25 species of Pigeons have been obtained."

according to Jerdon, "in having the neck-patch clayey buff instead of white, and much contracted in size; also in the less extent of the white border to the primaries." It is a very fine species; wing $10\frac{1}{4}$ inches.

Distribution.—Essentially a bird of the mountain forests, this splendid Pigeon is well known to all Europeans in the Central Province. It is very abundant in the Nuwara-Eliya plateau forests and on all the surrounding wooded slopes down to an elevation of about 3000 feet; below this it is not numerous. Kelaart speaks of examples being procured at Gampola; but this was in the days of forest; now that the whole country round that district is denuded, the visits of the Torrington Pigeon to it must be few and far between. I met with it at Nuwara Eliya in May, and found it plentiful on the Horton Plains in January; it seemed then to prefer the singular isolated groves on the plains to the surrounding forest, no doubt owing to a greater abundance of food obtaining at that time in the former. It is very numerous in the Peak forests, where I procured it under 3000 feet; and I have no doubt those vast jungles stretching along the high mountain-chain up to the Horton Plains now form its chief stronghold. In the Morowak Korale I have killed it at Aning-Kanda Estate as low as about 2400 feet, and between there and the Kukul Korale it is, I understand, abundant at times.

Mr. Holdsworth remarks that it "changes its locality according to the season and the time at which the fruit of particular trees ripens;" he found it numerous at Nuwara Eliya at the end and beginning of the year. Mr. Bligh has noticed that a migratory movement takes place just previous to the "bursting" of each monsoon; which, together with its wanderings in search of fruit, will probably account for its somewhat periodical appearance in many districts.

This species was named *torringtoniæ* by its discoverer Kelaart, in compliment to the Viscountess Torrington.

Habits.—Frequenting, for the most part, lofty trees in the primeval forests of the mountains, and being of a very shy and wary disposition, this fine Pigeon is generally a difficult bird to procure; but, notwithstanding, it is much sought after on account of its excellent flesh, and frequently falls to the planter's gun. It is entirely a fruit-eating species, and feeds more on the wild cinnamon-fruit than any other kind; on this it gorges itself to such an extent that I have found its crop burst wide open with the shock of falling to the ground: when thus satiated it is not so watchful as usual, and may sometimes be approached without the cracking of a twig or the noise of leaves crushed under foot frightening it off. It comes very early to roost; and I found that it resorted to the same trees night after night, coming home from its forest wanderings about 4 P.M., and settling down either in or somewhere near its intended roosting-place. It then commences its *coo* (which is a fine deep note, but not so guttural or resounding as that of the Imperial Pigeon), now and then moving about among the adjacent trees, but not flying away to any distance. By waiting in such places it may be more easily shot than in any other manner. About 10 o'clock in the morning, after feeding, I have found it resting on the under branches of moderately sized trees in the Nuwara-Eliya district; but, as a rule, it selects the loftiest branches to perch on. Its flight is very strong and swift, and it takes a good shot to bring it down as it darts out of some lofty tree in its forest haunts; Kelaart says that "it flies high and in long sweeps." In common with other Pigeons it drinks in the morning; and I have found it at mountain-streams as late as 9 P.M. Mr. Bligh informs me that it is unusual to find many together while feeding; but I imagine this depends on the quantity of fruit there may be on any given tree; he tells me he once saw 30 or 40 on a large tree in the Dambetenne gorge, but never observed so many together on any other occasion.

Nidification.—I was never fortunate enough to find this Pigeon's nest, nor to obtain much information from my friends in the Central Province concerning its nesting-habits. Mr. Bligh writes, "I have seen their nests both in spring and autumn as late as October; they generally build in lofty forest trees; but I once frightened a large young one from a nest on a small tree some 15 feet above the ground." Kelaart merely remarks, "Their nests are found on lofty trees." Its nest and eggs probably closely resemble those of its South-Indian ally, *P. elphinstoni*, which builds a "slight platform" of a nest, and generally only lays one egg—a broad oval, pure white, measuring from 1·46 to 1·56 inch in length by 1·07 to 1·2 inch in breadth.

The figure in the Plate accompanying this article is that of a male shot at Palabaddala on the pilgrims' path through the Peak forest.

Subgenus ALSOCOMUS.

Tarsus shorter and tail longer than in *Palumbus*.

ALSOCOMUS PUNICEUS.

(THE PURPLE WOOD-PIGEON.)

Alsocomus puniceus, Tickell, J. A. S. B. 1842, xi. p. 462; Blyth, Cat. B. Mus. A. S. B. p. 233 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 58; Jerdon, B. of Ind. iii. p. 462 (1864); Beavan, Ibis, 1868, p. 373; Holdsw. P. Z. S. 1872, p. 466; Ball, Str. Feath. 1874, p. 424, et 1878, vii. p. 224; Armstrong, ibid. 1876, p. 337; Davison & Hume, ibid. 1878, B. of Tenass. p. 418.

Kurunda kobæya, *Neeyang kobæya*, lit. "Season Pigeon" (*apud* Layard), Sinhalese.

Adult male. (Brit. Museum, Tenasserim) Wing 8·5 inches; tail 6·0; tarsus 1·0; bill at point 0·7.

(Tenasserim) "Length 14·12 to 15·6; wing 8·2 to 8·5, expanse 25·0 to 26·25; tail 5·5 to 6·6; tarsus 0·9 to 1·1; bill from gape 1·1 to 1·2."

Female. "Length 14·75 inches; wing 8·4, expanse 25·25; tail 5·5; tarsus 1·0; bill from gape 1·2" (*Hume*).

(Irrawaddy delta, *Armstrong*) "Length 15·75 inches; wing 8·65; tail 6·1; tarsus 1·0; bill to gape 1·05."

"Iris orange; bill purplish, tipped with horny; legs and feet purplish red" (*Armstrong*).

"Irides deep orange or pale yellow; eyelids bright red; orbital skin purplish pink; horny portion of bill bluish white, rest of bill and gape lake-pink; legs and feet purplish or lake-pink" (*Hume*).

(British Museum.) Forehead, lores, crown, and nape pale slaty greyish; lower part of face, ear-coverts, throat, and neck light coppery sienna, intensifying or becoming more vivid on the fore neck and under surface, and illumined with greenish bronze on the chest and hind neck; back, scapulars, wing-coverts, and inner secondaries copper-colour, blending into the paler hue of the crown, and the feathers broadly tipped with metallic amethystine red; primary-coverts, primaries, and secondaries slaty brown, the primaries pale on the inner webs; under tail-coverts dark ashy slate, blending into the colour of the lower breast; under wing-coverts bronze-red.

The female is said to be duller in its tints than the male.

Obs. The small genus to which this Pigeon belongs is an Indian one, and consists of two species only, the second of which (*A. hodgsoni*) inhabits Nepal and other mountains of the sub-Himalayan districts. These birds differ but little from the true Wood-Pigeons, and might well be classed in the genus *Palumbus*. *A. hodgsoni* is a larger bird than the present, measuring, according to Jerdon, 9 to 9¼ inches in the wing. It differs chiefly in having the median wing-coverts and flanks spotted with white, and the sides of the neck and underparts with a ruddy mesial streak to each feather.

Distribution.—Layard is the only naturalist who has recorded this Pigeon as a Ceylonese bird; and there is a specimen of his collecting in the Poole museum. His remarks on the species are as follows:—"This bird is but rarely a visitant of our island. I believe it appears during the fruiting of the cinnamon-tree; the natives all assure me of this." Had not Layard actually obtained specimens, and satisfactorily identified the bird, I should be inclined to doubt its occurrence in Ceylon. But it cannot well be a seasonal visitor, depending on the fruit of the cinnamon, otherwise it would occur annually, which it certainly does not, and it can only be looked upon as a rare straggler to the island. I once met with a flock of Pigeons, which I found frequenting cinnamon-bushes near Borella, early one morning at the latter end of 1869. I did not, however, succeed in procuring any, as they were very shy and took flight at once. They were about the size of the present species and of a brown colour, so that it is probable that they were the Purple Wood-Pigeon, as there is no other kind which would answer to the description. As it visits Ceylon it is strange that it has not been detected in Southern India; neither Jerdon nor any subsequent naturalist has met with it in the south of the peninsula. Jerdon

states that it is only found "in the eastern portion of Central India, extending to near the sea-coast in Midnapore, and probably southwards towards Cuttack." He was of opinion that it was more common in the countries to the east of the Bay of Bengal, in Assam, Arracan, and Tenasserim, and instances the island of Ramree, off the coast of Arrakan, where it is numerous. I do not find, however, that it is common on the Irrawaddy delta, for Dr. Armstrong procured but one specimen in evergreen forest near China Ba-keer. In Tenasserim it is, according to Messrs. Hume and Davison, sparingly distributed throughout the northern and central parts of the province. The latter gentleman, in fact, writes of it, "I have found this Pigeon very rare in Tenasserim, meeting with one now and then, and always singly. Captain Bingham tells me that they are not rare in the Sinzaway reserve forest on the Younzaleen." Tickell met with it in Singbhum, and Captain Beavan procured it in Maunbhum, on the banks of the river Cossye; elsewhere in the same region Mr. Ball has seen it on the Mahan river and its tributaries in Sirguja, but finding it very shy did not procure a specimen.

Habits.—Tickell met with the "Purple Wood-Pigeon" in small parties of four or five, always along the banks of rivers which were shaded by forest trees. It is, according to Jerdon, wary and difficult of approach; and the observations of subsequent naturalists corroborate this statement. In the 'Birds of India' it is stated to feed on the fruit of the Jamoon (*Eugenia jambolana*) morning and evening, and to roost, during the heat of the day, on the uppermost branches of lofty trees. Captain Beavan found that it likewise subsisted on the fruit of the *Strychnos nux-vomica*; he writes that "it is excessively wary and can seldom be procured, except by a flying shot, as the birds dart out of the thick foliage on hearing a step below them on the ground."

We learn nothing concerning its nidification from any source, and its eggs, therefore, remain to be described.

Genus COLUMBA.

Bill longer and more compressed than in the last genus; tumid portion swollen. Wings long and firm, the 2nd quill the longest. Tail rather short, very firm and rounded at the tip. Tarsi and feet more slender than in *Palumbus*, but with the claws short and very deep.

COLUMBA INTERMEDIA.

(THE INDIAN ROCK-PIGEON.)

Columba intermedia, Strickland, Ann. & Mag. Nat. Hist. 1844, xii. p. 39; Kelaart, Prodromus, Cat. p. 130 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 59; Jerdon, B. of Ind. iii. p. 469 (1864); Blyth, Ibis, 1867, p. 149; Holdsw. P. Z. S. 1872, p. 46; Hume, Str. Feath. 1873, p. 217; Ball, ibid. 1874, p. 425; Hume, Nests and Eggs, iii. p. 499 (1875); Legge, Ibis, 1875, p. 400; Ball, Str. Feath. 1875, p. 208; Butler & Hume, ibid. 1876, p. 3; Ball, ibid. 1878, vii. p. 224; Cripps, *t. c.* p. 296.

Columba œnas, Burgess, P. Z. S. 1855, p. 34.

Columba livia, Adams, P. Z. S. 1859, p. 187.

Columba livia, var., Blyth, Cat. B. Mus. A. S. B. p. 233 (1849); Schlegel, Mus. Pays-Bas, p. 63 (1873).

The Blue Rock-Pigeon of Sportsmen in India; *Rock-Pigeon*, Europeans in Ceylon. *Kabutar*, Hind.; *Gudi-pourai*, lit. "Pagoda-Pigeon," Telugu; *Kovilpora*, Tamil; *Parri*, Mahr. (Jerdon); *Māda-prāā*, Ceylonese Tamils.

Adult male and female. Length 13·2 to 13·5 inches; wing 8·6; tail 4·25; tarsus 1·1 to 1·2; middle toe and claw 1·25; bill to gape 0·95 to 1·0; expanse 24·6. Weight 12 oz.

Iris buff, mottled at the outer edge with red specks; eyelid plumbeous; bill blackish leaden; cere grey; legs and feet pinkish red, claws black.

Immediately after death the iris becomes yellowish red.

Head and upper part of throat unglossed dark bluish slate, the ear-coverts and cheeks generally the darkest, and blending into the metallic green and amethystine reflections of the entire neck, chest, and upper part of the interscapular region; back, wing-coverts, and secondaries pale slatish blue; the greater coverts and secondaries crossed by two black bands, the latter of which extends to the terminal portion of the tertials; primaries slaty brown; rump, upper tail-coverts, tail, and lower parts *darker slate-blue than the back*; the tail with a subterminal black band; abdomen and thigh-coverts paler than the breast; under wing-coverts and under surface of the quills at the base whitish.

Young. Iris sullied yellowish; legs and feet dusky reddish; head and neck brownish, the latter with very slight metallic reflections; wings brownish, with the dark bands narrow. Birds probably not quite mature have the lower part of the hind neck less illumined with the metallic reflections, and the wing-bars narrower, with less black on the tertials than in old birds.

Obs. The Indian Rock-Pigeon differs from the European one in having the rump dark slate, instead of pure white. The Ceylon race of this Pigeon is typical *C. intermedia*, having the rump as dark as any specimens I have seen from India. The species varies in this respect on the continent. Mr. Hume remarks that those he shot at the Vingorla rocks and St. George's Island on the west coast were the most typical he had seen from any part of India; they must therefore have been quite as dark as our Ceylonese birds.

Strickland, who first discriminated and described the Indian Pigeon under its present title, thus remarks concerning it:—"Distinguished, besides the banding and grey rump, by its black beak, and by the metallic-green feathers entirely surrounding the neck." The last character is, I think, worthless; but in the matter of its very dark colour above and beneath, and of its rump, *darker than the back*, the typical *C. intermedia* is a good subspecies or local race of the European bird. In the south of India and Ceylon there is scarcely any variation in the plumage, and the birds inhabiting these parts *constitute the subspecies*. In the north-west of India and parts of the Himalayas the intermediate races are evidently formed by the interbreeding of the two species, as everyone knows how prone Pigeons are to interbreed. There is much difference of opinion as to the validity of our Indian species, owing to the existence of intermediate forms; but I incline to the belief that there were originally two very distinct forms—the one (*C. livia*) *pale grey*, with a pure white rump, the other (*C. intermedia*) *leaden colour*, with the rump darker

than the back; and any races with at all a whitish rump, whether the albescent coloration be of small or great extent, I would class as strictly belonging to *C. livia*. The real character of the Indian species is that *its rump is darker instead of lighter than the back.*

Columba rupestris, Pallas, "The Blue Hill-Pigeon," the Asiatic pied race of *C. livia*, might equally well be styled a variety of the present species, and differs from it mainly in the white colour of the tail; the lower back, rump, and a broad bar across the tail are *white*; but the *upper tail-coverts* and the base of the tail are *slate-grey*, and the tip of the latter is very dark grey; the interscapular region and wings are pale slate-grey, the chest vinaceous, and the lower breast and abdomen albescent slaty grey. An example from the Altai Mountains measures—wing 8·5 inches, tail 4·5. It is found in Central Asia and Turkestan, and has been killed in Kumaon.

An example of *C. livia* from Mesopotamia measures 8·4 inches in the wing, and has the interscapular region and wing-coverts pale grey, and the *lower back and rump pure white*; the hind neck is not so highly illumined with green and copper-colour as in the Indian bird; the under surface is pale bluish grey. A Jericho specimen is slightly darker beneath. I notice these two as examples of this Pigeon from regions not very remote from India. In Cashmere Mr. Hume says an intermediate form exists with less of the pure white on the rump; but he has received the true *livia* from Sindh; and I observe that he allows Mr. Cripps's identification of it in Furreedpore to stand.

Distribution.—There are several isolated colonies of this fine Pigeon round the coast of Ceylon; but they are not restricted to two localities, as Layard and others have supposed. His remarks are:—"Extremely local, being confined to two places, 'Pigeon Island,' off Trincomalie, and a rock off the southern coast near Barberryn. From these it, of course, makes incursions into the interior, and I have heard of specimens being shot at Vavonia-Vlancolom, on the great central road, about fifty miles from Trincomalie."

The truth is, there are more colonies of these birds in the interior than one supposes. Those seen at Vavonia-Vlancolom evidently have their home in some of the isolated rocky masses which are characteristic of the northern forests. It is possible there may be a colony near Mahintale. There is a large one in a precipitous gorge through which the stream flows, which is crossed by the bridge just to the north of Nalanda. Here my friend Mr. Simpson, of the Indian telegraph-department, who informed me of the existence of the colony, has, on several occasions, had good sport, and thither people resort from Matale to shoot the Pigeons. There is another colony at the Hatagalla rocks, about 15 miles west of Hambantota; and I dare say there are others round the east coast, between there and Batticaloa. From inquiries I made at Ambalangoda, I imagine that the Barberryn rocks near Bentota are deserted, and consequently I did not visit them, but I may have been misinformed. The rocky islet which is so much frequented by these Pigeons, near Nilāvele, is not Pigeon Island itself, but a small island of about two or three acres in extent, half a mile nearer the shore, and about 13 miles

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Macropygia macroura, Gmelin (*Tourterelle à large queue du Sénégal*, Buffon, Pl. Enl. 329).—This Cuckoo-Dove was said by Bonaparte to inhabit Ceylon; but no one has ever seen it in the island, as far as I, or any other person who has paid any attention to the ornithology of Ceylon, can ascertain. It is not likely that a large bird like a Cuckoo-Dove could have been passed over all these years; it would have been recognizable on the wing by reason of its long tail, even if it had not actually been procured. The only evidence we have as to this Pigeon being a Ceylon bird is contained in the simple statement by Bonaparte (Consp. ii. p. 57), "ex Ceylon, nec Senegal."

The Marquis of Tweeddale, in a note to Mr. Holdsworth on this subject, remarks that it is doubtful whether Bonaparte ever saw the bird, the diagnosis given by him (*loc. cit.*) only containing "the prominent characters discernible in Buffon's plate." Buffon, who figured this Pigeon from a Senegal example presented by Adanson under the name of "Tourterelle à large queue du Sénégal," is, writes the Marquis, "most circumstantial in his account of the locality whence his bird was obtained; and the fact that the specimen bore a title given by Adanson strongly corroborates the Senegal origin." I am under the impression myself that Bonaparte got his information from a perusal of Temminck's remarks (Hist. des Colombes, p. 345) in reference to this Cuckoo-Dove—"Levaillant m'a dit avoir vu des individus rapportes de Ceylon." There could be no more broken reed to trust to in a matter of geographical distribution than Levaillant!

There are examples in the British Museum labelled as this species, one of which measures in the wing 6·3 and in the tail 8·5 inches. It is of a dusky coppery red on the back and upper tail-coverts; tail brownish copper-colour; head and sides of neck vinaceous, illumined with bronze-colour; chest and underparts fulvous tawny, with bronze reflections, each feather with a black wavy cross bar; flanks and under tail-coverts light cinnamon-colour. Species of Cuckoo-Dove found in the Indo-Malaccan region are:—*M. tusalia*, Hodgson, from the Eastern Himalayas; *M. ruficeps*, Temm., and *M. assimilis*, Hume, from Tenasserim; and *M. rufipennis*, Blyth, from the Nicobars.

from Trincomalie. They are met with in many places on the adjacent mainland; and I have seen them flying over the Peria-kerretje salt lake towards the remarkable rocky eminences rising up on its eastern shores. Here there is probably a colony.

In India it is a very abundant bird, and, contrary to its habit in Ceylon, is found much about "large buildings, such as churches, pagodas, mosques, tombs, and the like, frequently entering the verandahs of buildings and building in the crevices. Holes in walls of cities or towns, too, are favourite places; and in some parts of the country they prefer holes in wells, especially, I think, in the west of India, the Deccan, &c. . . . . . . The celebrated falls of Gaissoppa are tenanted by thousands of Blue Pigeons, which here associate with the large Alpine Swift" (*Jerdon*).

In the Deccan and in the Khandala district it is said to be very abundant and universally distributed; along the west coast there are various colonies, one of which is at the well-known Pigeon Island; and another at the Vingorla rocks, where there is a cliff pierced from side to side by a tunnel-like cave, which, Mr. Hume tells us, is tenanted by numbers of these birds. From either side of the peninsula it ranges west and east, and in the former direction is numerous. Captain Butler remarks that it abounds in the Guzerat province. In Sindh Mr. Hume found it abundant on the plains during the day, returning to the hills to roost, and when grain is ripening large flocks visit the neighbourhood of Jacobabad. It extends northward of Sindh, ranging into the Suliman hills, where Mr. Ball noticed it, as well as its European relative. Along the sub-Himalayan districts it is found as high up as Kotegurh, according to Herr von Pelzeln; and he also records it from Pangi, which has an elevation of 9000 feet. In Lower Bengal it is common, and in Chota Nagpur it is frequent, according to Mr. Ball, in deep rocky gorges cut by the rivers in Sirguja and Udipur, as also in other suitable localities throughout the division; he likewise records it from Sambalpur and Orissa north of the Mahanadi river, and from other localities in this eastern territory, while Mr. Hume notes it from Raipur. In Furreedpore it is very common, according to Mr. Cripps, frequenting the ruins of indigo-factories and temples. Blyth asserts that it is common in Burmah; but I notice that Mr. Oates did not procure it in Pegu, nor Dr. Armstrong in the Irrawaddy delta. Speaking of Tenasserim, Mr. Hume remarks that it occurs nowhere in the province. If it occurs in Northern Burmah, it must extend thither across to Siam; for in the national collection I have seen a specimen from that country not to be separated from Indian ones. Regarding its range northward of the Himalayas, it is difficult to speak with certainty; I find that it is doubtfully included by Dresser in Severtzoff's list of Turkestan birds, reference being made to a Pigeon said by the latter to breed throughout the country up to elevations of 4000 feet. Both *C. livia* and *C. rupestris* are found in Turkestan.

Habits.—In Ceylon the Blue Rock-Pigeon is essentially an inhabitant of out-of-the-way, wild, and little-frequented spots; the country does not, like India, abound in inland walled towns, temples, and pagodas, which there are the natural resort of the species; and it is consequently driven to such rocky localities as I have alluded to above, and is not therefore nearly such a well-known bird as in India. The eastern and northern bivisions of the island, however, teem with so many remarkable rocky masses, towering far above the circumjacent forests, such as the Friars Hood, "Westminster Abbey," the Elephant rock, the "Gunner's Coin," Sigiri and Dambulla rocks, Rittagalla, Mahintale, and a host more of nature's mighty castles, the very resorts of all others for the "Blue Rock," that it has always been a wonder to me that the species is not far more numerous than it is—the only solution of the problem being that these natural strongholds are situated too much in forest-country, besides which there is a lack throughout Ceylon of the extensive cultivated tracts which are necessary to the existence of this Pigeon.

The islet off Nilāvele is a mass of rock, its coast-line consisting of enormous boulders, and its summit divided by large crevices into huge "humps" of stone, on which, as well as on the surrounding masses, the Pigeons perch in scores. They fly across to the mainland in the early morning, and make their incursions over the adjoining paddy-fields, returning about noon to their stronghold, where, though they are difficult of approach when not feeding, they seem to evince little fear, owing probably to their being crammed with food. On the occasion of a visit to this spot with a friend we shot numbers, but did not succeed in driving away the flock, for they flew round and round over the water, and speedily realighted on the rocks. About 3 o'clock they start off again to the mainland, flying very strongly; and they may be met with almost anywhere along the adjoining sea-board during the afternoon. I have seen two or three at times feeding on the salt flats round the Nilāvele

lake, but what they were picking up I do not know. They are very destructive to the paddy, and devour an enormous quantity at a time, extending their crops with it to such an extent that I have taken a moderately-sized salt-cellar full from a specimen I was skinning.

In India they assemble in vast flocks in the cold season, and there no doubt do great damage wherever there is grain. As I have already set forth in my quotation from Jerdon, they dwell chiefly in architectural and not natural strongholds, the many temples, mosques, tombs, &c. with which the country abounds affording them ample shelter in districts where there are no rocks and caves. These resorts are, *primâ facie*, building-places, but are used as nightly roosting-abodes, and the Pigeons can be strictly said to dwell there. The note of this Pigeon much resembles that of some of the domesticated varieties of the "Rock;" it is entirely a grain-feeder, and does not, as far as I am aware, perch on trees.

Nidification.—In the Trincomalie district these Pigeons breed in May and June; I have shot the young birds in October, but have never taken the eggs. In India Mr. Hume writes that the breeding-season lasts from Christmas until May-day, and observes as follows:—"The nest is chiefly composed of thin sticks and twigs, but is often more or less lined with leaves of the tamarisk, feathers, &c. . . . . . . When undisturbed they will breed in incredible multitudes. At the grand old fort of Deig in Bhurtpoor, where, as in most parts of Rajpootana, they are sacred, and even a European who molested them would risk his life, several hundred thousand pairs must live and breed; a gun fired on the moat towards evening raises a dense cloud, obscuring utterly the waning day, and deafening one with the mighty rushing sound of countless strong and rapidly-plied pinions."

The eggs are glossy pure white, varying a good deal in size and shape, and averaging from 1·45 to 1·12 inch.

Genus TURTUR.

Bill slender, the horny apical portion much less than the soft basal part, and slightly arched. Wings moderately long and pointed, the 2nd or the 3rd quill the longest. Tail large, rounded at the tip; graduated in some. Legs and feet somewhat slender; the tarsus longer than the middle toe, covered with broad transverse scutes in front. Lateral toes equal.

Of delicate form. Head small. Neck ornamented with a demi-collar or patch of pale-tipped feathers.

TURTUR RISORIUS.

(THE COMMON INDIAN DOVE.)

Columba risoria, Linn. Syst. Nat. i. p. 285 (1760).

Turtur risorius, Blyth, Cat. B. Mus. A. S. B. p. 238 (1849); Kelaart, Prodromus, Cat. p. 130 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 59; Blyth, Ibis, 1867, p. 151; Swinhoe, P. Z. S. 1871, p. 397; Hume, Str. Feath. 1873, p. 218; Adam, *t. c.* p. 390; Hume, Nests and Eggs, iii. p. 506 (1875); id. Str. Feath. 1875, p. 165; Butler & Hume, ibid. 1876, p. 3; Fairbank, ibid. 1877, p. 409.

Turtur risoria, Jerdon, B. of Ind. iii. p. 481 (1864); Holdsw. P. Z. S. 1872, p. 467; Legge, Ibis, 1874, p. 26; Ball, Str. Feath. 1878, vii. p. 224.

The Common Ring-Dove, The Collared Turtle-Dove of authors; *Turtle-Dove, Grey Dove*, Europeans in Northern Province, Ceylon. *Pomba de Cinsa*, Portuguese in Ceylon; *Dhor fachta*, Hind. in the south; *Kalhak, Pauk-ghughu*, Bengal.; *Pedda bella-guwa*, Telugu (Jerdon); *Ringel Duyven*, Dutch in Ceylon; *Cally-prāā*, Ceylonese Tamils (from "Cally," *Euphorbia*), Layard.

Koba-ya, Sinhalese.

Adult male and female. Length 11·8 to 12·5 inches; wing 6·2 to 6·5; tail 5·1 to 5·5; tarsus 0·95 to 1·0; middle toe and claw 1·05 to 1·2; bill to gape 0·9.

Iris crimson; orbital skin bluish white; bill blackish; legs and feet purple-red; claws black.

Head, nape, sides of neck, throat, fore neck, and breast delicate vinous grey, the head marked with ashy, the breast passing into delicate bluish ashy grey on the lower parts; chin white; round the hind neck to about the centre of its sides a black collar, the feathers above it edged with delicate bluish white; lower part of hind neck, back, wing-coverts, upper tertials, upper tail-coverts, and central tail-feathers above brownish grey, suffused with bluish ashy on the sides of the rump, and with the scapulars and lesser wing-coverts edged pale; primaries dark brown, with pale margins towards their tips; primary-coverts and secondaries with their coverts, together with the feathers at the point of the wing, bluish ashy; beneath, the basal part of all but the central rectrices black, with the terminal half white, the upper surface being suffused with bluish ashy, and washed outwardly with brownish towards the centre of the tail; on the lateral outer web the black projects towards the tip; under tail-coverts darker ashy than the lower parts, and the under wing-coverts ashy white.

Young. Immature birds are said to be reddish above: some that I have seen have the head vinous grey; these are probably not adults.

Obs. A comparison of examples from Kamptee with my Ceylonese skins enables me to say that our birds are not characterized by any tints not present in Indian birds; the birds in question are identical with mine as regards the hues of the back, head, and underparts: wing 6·4 inches. The specimens from Gor es Safiek, Palestine, are slightly paler than mine in the back, but otherwise the same; they are slightly larger—wing 6·6 and 6·7 inches respectively. A Baluchistan skin is brown on the back and head, and the chest is more ruddy than others.

Mr. Hume separates the Turkestan race (Str. Feath. 1874, p. 519) as *T. stoliczkæ* on account of its larger size, broader and whiter nuchal collar, and more deeply tipped tail-feathers. The wing in his type specimen measures 7·35 inches.

There is much difference of opinion as to which species the Domestic Ring-Dove sprung from originally; Blyth says:— "Of several kindred races I do not know one that can be satisfactorily assigned as the true origin of the common cage-bird." The note of the latter is quite different from *T. risorius* and it is smaller. The two interbreed well.

Distribution.—The Turtle-Dove is remarkably local in Ceylon, being apparently a bird of the driest districts of the north of the Jaffna peninsula and the west coast down as far as Puttalam. The note is so very peculiar and so totally unlike that of *T. suratensis*, the common Ceylon species, that it cannot fail to serve as a sure

guide to the distribution of the bird. I found it common all over the Jaffna peninsula, frequenting even the mangroves on the borders of the great swamp near Ethelumaduvil; it was also met with on the islands, and on the Erinativoe group, on the coast between Kalmunai Point and Mantotte, and in Manaar Island in great abundance. About Aripu and Salavatori it was more numerous than in the peninsula; and here Mr. Holdsworth records it as very abundant. I understand it is found near Puttalam as a straggler; but south of that place, at Chilaw, I only saw *T. suratensis*. It is never seen at Trincomalie; but it probably ranges down the coast to Mullaittivu, where the country is open. I did not see it anywhere on the south-east coast; but I cannot but think that it occurs there about Yāla, as Layard says it is found wherever the *Euphorbia*-trees abound. At present, as far as I know, its range is much the same as the Grey Partridge (*Ortygornis pondicerianus*). Mr. Simpson, who has travelled over all the north-west of Ceylon, both in the interior and on the coast, tells me that it does not extend far inland from Mantotte, but is essentially a bird of the coast-districts.

Throughout the whole Indian empire it is a common bird in suitable open country; Jerdon says that it is rare in Malabar, and generally in forest country. The Rev. Dr. Fairbank found it in the plains by the Palanis, but not so abundantly as in the Deccan, where it occurs, he says, everywhere. Following it first, as is my rule, in a north-westerly direction, we find that Messrs. Butler, Adam, and Hume all record it as abundant in the Sindh, Guzerat, and Rajpootana divisions; Captain Butler says that it abounds all over the plains, but does not occur in any numbers in the hills. Beyond the confines of India it extends into Baluchistan, where Mr. Blanford met with it; he was likewise informed by Major St. John that he saw a pair in captivity at Isfahan, said to have been taken from a nest there. Canon Tristram states that it is a permanent resident round the Dead Sea ('Ibis,' 1868, p. 211), and that in spring its numbers are largely increased, when it spreads itself throughout the greater part of Palestine to Mount Tabor, living in small flocks of eight or twelve. Mr. Taylor procured it at Constantinople, and there, as also in some of the Macedonian villages, Messrs. Elwes and Buckley state that it is common.

All across continental India to the Calcutta district it is of course found, and northwards of that region ascends the Himalayas as high as Mussoorie to breed. In that neighbourhood, says Captain Hutton, it arrives at the end of March, leaving again for the plains in October. Throughout Chota Nagpur it is found, and elsewhere Mr. Ball records it from Bardwan and Orissa north of the Mahanadi river. In Furreedpore Mr. Cripps records it as an abundant permanent resident. I do not know whether it extends from Dacca over into Cachar; but in Pegu, according to the experience of Messrs. Feilden and Oates, it does not appear to be common; and southward of that province it does not extend into Tenasserim. The Ringed Dove found in China is admitted to be the same as our species. Wallace includes "Chinese Asia" in the distribution of *T. risorius*; and Swinhoe identified a specimen from Tokio, in Japan, as belonging to it. Swinhoe records it from villages about the Great Wall, but not from Pekin itself; and Oustalet remarks that it is found in the north-west provinces of China and on the confines of Mongolia.

Habits.—In Ceylon dry open country dotted with small trees and clumps of scrub is suitable to the habits of this Pigeon. It also affects isolated groves of mango and other trees and cocoanut and palmyra topes in the Jaffna peninsula; and in this district I likewise found it in mangrove-jungle. In the island of Manaar it dwells in the thorny scrub abundant near the town, seating itself often on the limbs of the huge baobab-trees, and giving out its melodious love-note. Its voice is much deeper than that of the Spotted Dove, and appeared to my ears to be well rendered by the words *coo-hooo-kuk* often repeated, the second syllable being deep and long-drawn in tone. Blyth, however, who remarks on its note being very different from that of the Domestic Turtle-Dove, considers that it may be expressed by *kookoo-koo, kookoo-koo*. It is a pleasing sound when heard in the early morning in the low scrubs lining the north-western coast of Ceylon; and I remember well, having beached my canoe at midnight on the sands beneath the ruins of the Dutch settlement at Aripu, being awoke at dawn, as I lay in the little bamboo "crib" constructed on the outrigger-spars of the craft, by the soft cooing of the doves and the harsh cackle of the similarly distributed Grey Partridge, with which the low jungle on that coast abounds.

This Dove has a great partiality for *Euphorbia*-trees (*E. antiquorum*), and was considered by Layard to be abundant wherever this tree grew; be this as it may, it certainly is usually found about these trees in the north, and I was surprised that I did not hear its note anywhere in the south-east, where the *Euphorbia* abounds.

Its Tamil name in the north of Ceylon is derived from this liking to the tree in question. In the north-west portion of India it exhibits a similar taste, Captain Butler writing that "it is particularly partial to clumps of babool-trees, *Zizyphus*-bushes, and *Euphorbia*-hedges." It is essentially granivorous in diet, feeding on grass-seeds as well as corn of various kinds; and in crop-season is stated by Mr. Cripps to collect in flocks of ten to thirty for the purpose of feeding on grain. Its flight is strong, but not, I think, so swift as that of the Spotted Dove.

In South-eastern Europe it manifests a particularly tame disposition; for Messrs. Elwes and Buckley, in their paper on the birds of Turkey, say that it loves "the neighbourhood of dwellings, and may be seen sitting like a sparrow on the roofs of the houses, where it is never molested by the Turks."

Nidification.—Layard writes concerning the nesting of this Dove:—"It breeds in the spring, fabricating a loose careless nest of small twigs in the *Euphorbia*-trees, in which it deposits two oval and shining white eggs: axis 14 lines (1·14 inch), diameter 11 lines (0·84 inch)." When I was in the Jaffna district, in March 1876, I ascertained by dissection that it was then breeding, but did not find its nest.

In the Mount Aboo district, according to Captain Butler, it breeds in great quantities at the end of the rains, commencing to lay about the second week in August. Writing of a district on the opposite side of the peninsula (Furreedpore, near Calcutta), Mr. Cripps says, "This species breeds from December till July in small bushes and trees at from 6 to 12 feet from the ground, in very exposed situations. The nest is a mere apology of twigs, and never contains more than two eggs." Mr. Hume considers that it breeds throughout the year, having taken the eggs himself "in every month from December till August." Although the nest is usually placed on a tree or bush, it has been known to nest on bare ground; my late friend, Mr. A. Anderson, to whom we are indebted for so much information concerning the nesting of Indian birds, writes:—"On the 20th of November (1875), while drawing sandy downs covered with low flowering grass, such as the *Desert fox* delights in, a dove was flushed from off her nest, which contained a pair of fresh eggs. These clearly belonged to *T. risoria*; but not having seen the bird myself, and identification in a case of this sort being a matter of absolute necessity, I replaced the eggs, and subsequently shot one of the parent birds.

"The nest, if such it can be styled, consisted of a few dry twigs and grass-stalks which rested on the bare sand. There was no tree nearer than a mile; but the ground on all sides was covered with grass-seeds, which constitute the chief food of these birds; and this pair were evidently sensible enough to adapt themselves to the force of circumstances."

Mr. Hume describes the eggs as broad perfect ovals, white and glossy; the majority have a just perceptible ivory tinge, and average in size 1·16 inch in length by 0·92 inch in breadth.

TURTUR SURATENSIS*.

(THE SPOTTED DOVE.)

Columba suratensis, Gmel. ed. Syst. Nat. i. p. 778 (1788).

Turtur suratensis (Gm.), Blyth, J. A. S. B. 1845, xiv. p. 874; id. Cat. B. Mus. A. S. B. p. 236 (1849); Kelaart, Prodromus, Cat. p. 130 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 60; Jerdon, B. of Ind. iii. p. 479 (1864); Blyth, Ibis, 1867, p. 150; Holdsw. P. Z. S. 1872, p. 467; Adam, Str. Feath. 1873, p. 390; Ball, ibid. 1874, p. 425; Hume, Nests and Eggs, iii. p. 504 (1875); Legge, Ibis, 1874, p. 26, et 1875, p. 275; Butler & Hume, Str. Feath. 1876, p. 3; Fairbank, *t. c.* p. 262, et 1877, p. 409; Ball, ibid. 1878, vii. p. 224; Cripps, *t. c.* p. 297.

Turtur ceylonensis, Reichenbach, Tauben, p. 73.

Tourterelle de Surat, Sonnerat; *The Speckled Dove*, Sportsmen in India; *Turtle-Dove*, Europeans in Ceylon. *Chitroka fachta* and *Chitla*, Hind.; *Chaval-ghughu*, Bengal.; *Poda bella guwa*, Telugu; *Pulipora*, lit. "Spotted Pigeon," Tamil; *Bode* of the Gonds; *Ku-er-pho*, Lepchas; *Piap-chu*, Bhotias; *Pomba de Cinsa*, Portuguese in Ceylon; *Mani-prāā*, lit. "Bead-Dove," Ceylonese Tamils.

Kobæya and *Allu-kobæya*, Sinhalese.

Adult male and female. Length 11·2 to 11·5 inches; wing 5·1 to 5·4; tail 5·25, lateral feathers 1·5 shorter than the central; tarsus 0·8 to 0·9; middle toe 1·05 to 1·1; bill to gape 0·65 to 0·7.

Females are, as a rule, smaller than males.

Iris mottled pink or reddish outwardly, with a brown inner circle; orbital skin red; bill dark leaden, in some slightly suffused with a reddish hue; legs and feet lake-red.

Head, nape, throat, fore neck, and breast vinaceous ashy (the ruddy tint of the lower parts variable), paling into whitish ashy on the forehead and cheeks, and albescent at the chin; a black line through the lores and a broad black patch reaching from each side of the hind neck across it, and blending into the smoky ashy brown of the back, scapulars, and tertials, each feather of the collar divergent at the tips and with two white terminal spots, those of the back with rufous-grey spots; the wing-coverts and tertials with a terminal black spot spreading up the shaft and set off by an isabelline or greyish-red spot on each side; quills blackish brown; point of the wing and the greater wing-coverts delicate bluish grey, the feathers on the former part with a black central stripe; upper tail-coverts and four central tail-feathers brownish ashy, the coverts with a dark terminal spot and a light one at each side of it; remaining tail-feathers black on the basal half and white on the rest, with the upper surface pervaded with ashy; lower parts albescent, blending into the ruddy of the breast; under tail-coverts white, frequently with blackish terminal spots.

Young. When first hatched the nestling is covered with white hair-like plumes above, and with slightly rufescent feathers beneath. Immature birds have the feathers of the breast and fore neck narrowly tipped with blackish grey.

Obs. The Ceylonese Spotted Dove was separated by Reichenbach from the Indian on account of its smaller size. I find, on comparing my specimens with others from India in the British Museum, that the wings of the latter do, as a rule, average larger than those of insular birds; but the difference is not sufficient, in a bird of the size of this Dove, to warrant our separating the Ceylon race. I find, for example, a specimen from the North-west

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* This Dove, which belongs to Bonaparte's section of the Turtle-Doves (*Tigrini*), differs from the last in the spotted character of the neck-patch feathers, which are furcate at the tips; the tail is likewise graduated.

Himalayas, collected by Capt. Pinwell, measures 5·6 inches in the wing, which is only 0·1 more than large Ceylonese individuals. Some Indian specimens are characterized by a stronger blue tint on the head than is noticeable in most Ceylon birds.

Allied to the present species is *Turtur tigrinus*, from the Malay peninsula, Sumatra, Java, Celebes, Lombok, Timor, and other islands. It differs chiefly in its plain or unspotted back, and in the different colour of the spots on the wing-coverts, these being more rufous than in *T. suratensis*. It is, however, a darker bird, and has the abdomen and flanks of a warm fulvous colour, and the isabelline of the chest and breast deeper than in its Indian ally. The wings of four examples in the national collection, from the Malay archipelago, vary from 5·5 to 5·7 inches. A Labuan specimen has the under surface lighter than any others, and the head bluer. In the Malay peninsula and Tenasserim, and also in Burmah, this species, according to Mr. Hume, passes through intermediate races, approximating, in the latter region, to the Indian bird, where it has the vinaceous spots of true *suratensis* reduced to narrow lines, with the dark feather-centres and tips of *tigrinus*. This race would, however, in my opinion, be more related to the former than the latter species, which is distinguished by having no pale markings at all on the back.

T. chinensis is another species, larger than *T. tigrinus*, and perfectly plain on the back, without the dark central lines, and with the under surface darker.

Distribution.—This is an exceedingly numerous bird in Ceylon, being more or less diffused over the whole of the low country, in parts of which it is remarkably abundant, and is likewise an inhabitant of the Kandyan province up to an altitude of 3000 feet or more. Common and well known in the immediate vicinity of Colombo, it is equally so throughout the interior of the Western Province, inhabiting suitable localities in the well-wooded district of Saffragam, and likewise in the equally sylvan and hilly tract of country in the south-west of the island. It is independent of climate, for it is almost quite as common in the dry section of country eastward of the southern ranges; and in the open tracts, surrounded by wood, of the Eastern Province, and thence north to Trincomalie, I scarcely ever failed to meet with it. It is found in the interior of the northern division of the island wherever there is open land, on the borders of tanks, paddy-fields, or clearings surrounding jungle villages. In the extreme north it is common, but in places not so abundant as the last. Layard found it numerous in the Jaffna peninsula, and so did Mr. Holdsworth at Aripu. I have observed it in Dumbara and in the Knuckles, Deltota, Hewahette, and Pusselawa districts, as also in Uva; but I do not think it ranges much higher than these upland valleys, where it affects the vicinity of the "terraced" paddy-fields of the Kandyans.

It is generally distributed throughout India from the extreme south to the Himalayas, which it ascends to an altitude of 7000 feet. "As a rule," says Jerdon, "it is most abundant in forest districts or well-wooded countries, and is consequently rare in the bare Carnatic tableland, the Deccan, and the North-western Provinces generally; and most abundant on the Malabar coast up to Surat, Lower Bengal, and the foot of the Himalayas." It breeds throughout Nepal, according to Mr. Hodgson, and in Upper India, says Mr. Hume, "chiefly affects the submontane districts, whence, as summer approaches, many migrate to the lower forest-clad hills and valleys, where also a good many are permanent residents. In dry tracts such as Cawnpore, Etawah, and Agra they are but rarely seen, and still more rarely found breeding, while at Bareilly, Bijnour, and Shahjehanpoor they are the commonest Dove." Of late it has been recorded by the Rev. Dr. Fairbank as the most common Dove at the base and on the lower ranges of the Palanis, and also as being abundant on the western slopes of the Mahabaleshwar hills; by Mr. Davidson as common at Sholapoor in the Deccan during the rains; by Mr. Ball as occurring at Bardwan, in the Rajmehal hills, at Midnapur, Manbhum, Lohardugga, Sambalpur, Orissa, Nowagarh, and Karial, and throughout Chota Nagpur, not being, however, so common there as the last species. In the north-west of the empire it is not so numerous, for Capt. Malden only met with it in Upper Sindh. In the wooded districts near Mount Aboo it is common, but near Deesa, according to Capt. Butler, it is only found during the rains; and this is also the case about the Sambhur Lake. In Furreedpore and about Calcutta it is common and resident. It does not seem to extend beyond Dacca towards the east, for I find no comment concerning it in the 'List of the Birds of Cachar;' while in Burmah it seems to exist in an intermediate form more nearly related to itself than to its Malayan ally *T. tigrinus*.

Habits.—Wherever there are trees surrounding, or encircled by, open places, this familiar little Dove

is sure to be found. It delights in the bushy trees which here and there have been left standing in the cinnamon-gardens, and after it has satisfied its appetite on the grass-seeds which it finds in abundance in this locality, flies about from tree to tree, or takes up its perch on an outspreading branch and *coos* to its mate. When perched it is very wary and scarcely ever lets one approach it within gun-shot; but when feeding in a newly-cut paddy-field, or about the native thrashing-places (which it constantly frequents, even months after the grain has been gathered in), or on a road where it scrutinizes the dried-up droppings of cattle or horses, or while elegantly tripping over some newly-burnt jungle-clearing (another favourite resort), it will not rise till approached within a moderate distance, when, taking a few hurried paces, it will fly off with a Pigeon-like clapping of its wings and settle down in the nearest inviting tree. In the interior every paddy-field, every clearing in the forest, and every cheena under cultivation has its attendant flock of Doves, which find abundant sustenance in the grain or grass-seeds of such resorts. Its *coo* is a plaintive note, not nearly so deep as that of the last species. It is, as Blyth remarks, difficult to express in writing, and he likens it to the syllables *oot-raow-oo-oot-raow-oo*.

Its flight is swift and graceful; and during the breeding-season it indulges in sundry careerings on the wing, rising in the air and then circling down with outspread wings to its perch, these performances being apparently for the mutual gratification of the happy pair during this joyous time of their existence.

From the clever pen of Layard we have the following passage eminently descriptive of this habit:—"The male bird will at such times soar away from the branch on which his 'meek-eyed' partner is reposing to a considerable altitude, rising almost perpendicularly and clapping his wings together over his back, then opening them and spreading his tail he sails downwards in decreasing circles and graceful curves to the object of his affections, who greets him with the tenderest and blandest cooings, and, while he struts and pouts before her, caresses his head and wings with her bill. The fervour of their love being assuaged, away they both soar in the fulness of their joy, to descend again in undulating curves, crossing and recrossing each other with the most easy and graceful flight, to the more sober and matter-of-fact work of collecting building-materials for the nest."

They feed in the mornings until about 9 A.M., and then again in the afternoon, commencing about 3 o'clock, when they may generally be seen on the ground at the edges of woods, copses, and groves, or on native compounds often not far from the cottages.

Nidification.—In the Western Province this Dove breeds from March until June, after which it no doubt lays again, for the eggs may be taken almost at any time of the year. I have found the nests in bushy umbrageous trees at about 10 or 15 feet from the ground, generally situated near the end of the branch, also on low date-palms (a favourite situation), placed near the trunk at the origin of the frond. They are made of fine twigs neatly laid over one another, some of them interlaced so as at times to form a firmly constructed fabric, in the centre of which there is a just perceptible hollow. The eggs are two in number, exact ovals, glossy, and pure white, measuring from 1·0 to 1·12 inch in length by from 0·8 to 0·15 inch in breadth.

According to most observers in India, its nest is generally very exposed and often placed on low bushes, where it can be seen by the most casual observer; and it is therefore no wonder that the eggs are frequently taken by such incorrigible thieves as the Indian Corby and Common Magpie (*Dendrocitta rufa*). Mr. Thompson, in writing of its nidification in the Lower Himalayas, where it is abundant, says:—"On a nest being robbed the parent birds will forthwith set to work and build another; and if that be robbed in its turn, they will still go on seeking new sites, building new nests, and laying fresh eggs.

"The female sits very close on her nest; but if forced from it she will at times fly or, in fact, throw herself down on the ground before the intruder, and will then mimic before his astonished gaze all the actions and efforts of a wounded bird trying to escape its pursuers, and thus endeavours to turn him from the nest." Mr. Hume gives the average of 33 eggs as 1·06 by 0·82 inch, which is no larger than that of the Ceylon bird, notwithstanding its slight inferiority of wing.

TURTUR TRANQUEBARICUS.

(THE INDIAN RED DOVE.)

Columba tranquebarica, Herm. Obs. Zool. p. 200 (1804), ex Tranquebaria.

Turtur humilis (Temm.), Blyth, Cat. B. Mus. A. S. B. p. 236 (1849); Kelaart, Prodromus, Cat. p. 130 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 60; Jerdon, B. of Ind. iii. p. 482 (1864); Hume, Str. Feath. 1873, p. 218; Ball, ibid. 1874, p. 425; Hume, ibid. 1875, p. 165; id. Nests and Eggs, iii. p. 507 (1875); Butler & Hume, ibid. 1876, p. 3; Fairbank, *t. c.* p. 262.

Turtur tranquebarica (Herm.), Hume, Str. Feath. 1876, p. 293; Davidson & Wender, ibid. 1877, vii. p. 86; Ball, *t. c.* p. 224; Cripps, *t. c.* p. 297; Hume (List Ind. B.), ibid. 1879, p. 110.

The Ruddy Ring-Dove of some Indian writers. *Seroti-fachta*, Hind.; *Golabi-ghughu*, *Tumakhuri*, lit. "Rose-coloured or Copper-coloured Dove," Bengal.; *Rah-guwa*, lit. "Tile-coloured Dove;" also *Peri-aripu guwa*, Telugu.

Adult male. "Length 9·42 inches; wing 5·25, expanse 16·0; tail from vent 3·42; tarsus 0·80; bill from gape 0·81, at front 0·58; weight 3·5 oz." (*Cripps*). Jerdon's measurements are:—"Length 9·25 inches; wing 5·5; tail 3·25." Nepal (British Museum): wing 5·5 inches; tail 4·0; tarsus 0·75; middle toe 0·75; bill to gape 0·78.

Obs. This example would appear to be much larger than those from the low country, as exemplified by the above measurements and Mr. Hume's statement that 9·25 inches total length (wing 5·25) is the average of five males. "Iris brown; bill black; legs and feet horny black" (*Cripps*).

Male (Nepal). Head and nape slate-blue, paling on the face and forehead; below the neck a broad black demi-collar, set off above by a whitish edge; lower part of the hind neck, interscapular region, terminal portion of the wing-coverts, and the innermost secondaries, together with the fore neck, chest, and breast vinous red, paler and also pervaded with ashy on the breast and fore neck; back, rump, and upper tail-coverts dark plumbeous, paler on the tail-coverts than on the back; primaries brownish slate, with pale edges; secondaries the same, tinged with reddish on the outer webs; basal portion of the wing-covert feathers slaty; central tail-feathers brownish slate-colour, the lateral pair white on the outer webs and black on the basal part of the inner webs; remaining feathers whitish, tinged with slaty near the tips, and darkening into blackish at the bases; flanks leaden grey; vent and under tail-coverts bluish white; under wing *pale slaty grey*.

Female. Back and wings dull reddish brown, and the breast and under surface pale earthy grey, whitish on the lower parts; wing 5·1 inches.

Obs. I have adopted for the bird procured by Layard in the Jaffna peninsula the title used of late for the Indian Ruddy Dove, instead of that under which it was formerly known, and which is now considered to be better applied to the species inhabiting the Philippine Islands and China. Lord Tweeddale, in a paper on the birds of the Philippine Islands, has recently pointed out the distinction between the two races. The eastern form, *T. humilis* (with which Mr. Hume unites the bird inhabiting the Andamans, Tenasserim, and Burmah), differs in being larger and of a darker red beneath, with the head, rump, and under tail-coverts of a darker ash-colour than the Indian race; the under wing is also *dark ash-colour* instead of pale ashy. It is a matter of conjecture, however, which race Temminck referred to, for he united the two under his title of *humilis*, inasmuch as he remarks—"This species inhabits Bengal and the island of Luzon."

It matters not, however, whether Temminck referred to and figured (Pl. Col. 258, 259, 1838) the Indian or the Philippine bird as far as the former (that which we have to do with) is concerned, for Hermann's title is of thirty-four years' prior date to his; and as the specimen he named came from Tranquebar, in the Carnatic, the matter is settled.

Mr. Hume gives the measurements of the wing of *T. humilis* as generally 5·5 inches or more; but it will be seen that a Nepal specimen belonging to the Indian form measures as much as this. Hill specimens may, however, average larger than those from Bengal.

Distribution.—This little Dove appears to have visited the north of Ceylon many years ago, but does not seem to have been subsequently noticed in the island. Layard, its discoverer as a Ceylonese species, writes a long account of his meeting with it in a tope of cocoanut- and palmyra-trees, situated in the middle of the plain separating the cultivated district of Pt. Pedro from the fertile country between Jaffna and Chavagacherry. The writer cleverly describes the difficulty he found in crossing this waste in the hot season, when every thing was parched up by the burning rays of a tropical sun, combined with the drought that prevails at that time in the Northern Province. His duty compelled him to visit the tope in question; and after speaking of the effect which the heat had upon himself, his dogs, and the native attendants, he continues:—"The mirage deluded us with its pictures of limpid water and tall trees, my spirits almost sank, and I thought I never should reach the trees before us in the distance. How willingly would I, had I been a litigant for that miserable tope, have resigned it rather than have taken the trouble to walk to it! Suddenly—the first living thing I had seen for hours—a Pigeon darted past us in full flight towards the tope; I hardly cared to look at it with my half-closed aching eyes; but its pink-coloured back and small size at once roused me—it was something new! O, how eagerly I watched its flight to that now coveted tope, and longed to be there. The natives knew of no other species but the '*Cally*' and '*Māni prāās*,' and stoutly maintained there were none; I was equally positive the bird that flew by was neither of *them*, and hurried forward; thirst and heat were alike forgotten; and when I reached the spot, instead of partaking of the cocoanuts which the head-man's forethought had provided there for me, I sprang on the low wall and peered eagerly among the trees. *Turtur suratensis* and *T. risorius* perched about the branches in abundance, and—could I believe my eyes?—on a dry leafless 'matty' projecting from a palmirah tree, and supporting the twigs of a nest, sat a pair of the lovely little *T. humilis*. There they were, 'billing and cooing,' in sweet but dangerous proximity, for the same shot laid them both dead at my feet, and in another minute a native lad who had followed me brought down two shining, smooth, white eggs from their nest. This was not the only pair in the tope, and I soon procured half a dozen specimens, and might have killed as many more. An old head-man who was with me, and who had the reputation of being the best sportsman in my district, assured me he had neither seen nor heard of this description of Pigeon before; and so said all present, some of them old men who had spent their lives in that neighbourhood. I had lived more than a year in the district and killed dozens of Doves without finding one; nor did I ever after, though I often shot along the cultivation at the edge of the plain, meet with them. Had they bred there that year only? where did they come from? why did they select that lonely tope and keep so closely to it? I left the district and never could learn, nor did I ever find any native who had met with them in other parts of the island. Dr. Kelaart knew nothing of it, and only included it in his list on Mr. Blyth's authority, and I furnished the latter with data; so whether the little colony raised their young and departed, or breed there still, 'remains an untold tale.'"

Civil servants and others collecting in the north of Ceylon would do well to ascertain whether this Dove ever visits the island now.

Jerdon says that this species is "found throughout the whole of India to the foot of the Himalayas and the Punjab, avoiding the Malabar forests and generally the jungly and hilly countries; and not very common in Lower Bengal." These remarks appear to be very correct, for I do not find it recorded from either the Travancore or Palani hills. Concerning the low country of the Carnatic we have no recent information; but we know that Hermann's specimen came from Tranquebar, on the coast of that part which runs due north on the Indian side of Palk's Straits; and thence it probably visited Ceylon *viâ* Point Calimere. It is common in the Deccan, and found in the Ahmednagar district in flocks in the cold season. Further north on the same side of the peninsula it is recorded by Captain Butler as common in the plains round Mount Aboo, and met with in most parts of the hills; at the Sambhur Lake Mr. Adam says it is plentiful, breeding there throughout the year. Writing of the north of India, Mr. Hume remarks that it is very capriciously distributed. "It is common," he says, "in some dry well-cultivated districts like Etawah, where there are plenty of old mango-groves. It is very common in some of the comparatively humid tracts like Bareilly, and again in the sâl-jungles of the Kumaon Bhabur and the Nepal Terai; on the other hand, over wide extents of similar country it is scarcely to be seen." Mr. Ball records it from Sambalpur and Orissa to the north of the river Mahanadi, and likewise from Lohardugga and Manbhum; while writing of Chota Nagpur generally, he says that it is found throughout the province, and most common in Sirguja. In Furreedpore, east of Calcutta, it is far from common, according to Mr. Cripps, although a resident species.

To the eastward of the Bay it is replaced by the larger darker form already alluded to, and which is recorded from the Irrawaddy delta, Rangoon, and Tenasserim. The Pegu specimens appear to belong to the Indian race (Str. Feath. 1875, p. 165).

Habits.—As already remarked, this pretty little Dove is capricious in its selection of country, there being something in its food or mode of life which restricts its distribution, but which naturalists do not seem to be acquainted with. In some districts, such as Sambhur, it is fond of arid places, and in others, such as Furreedpore, the converse is the case, for Mr. Cripps remarks that it frequents woods more than either of the two last species. Its food mainly consists of grass-seeds; but when grain is procurable it must levy heavy contributions on it, as do all its congeners.

Jerdon writes of it as affecting "large groves of trees near cultivation, often feeding under the shade of trees, but also betaking itself to fields, grass-downs, and bare spots near rivers and tanks. Its *coo* is short, deep, and grunt-like." Like other Doves, it thrives in confinement, and will, according to Blyth, breed in an aviary.

Nidification.—Layard does not mention at what season he procured his birds, which, it will be perceived, were nesting; but I conclude it was about April, as at that season the plain he speaks of is dried up. Mr. Hume writes:—"I have always found the nests at or near the extremities of the lower boughs of very large trees, at heights of from 8 to 15 feet from the ground, and laid across any two or three horizontal branchlets. As a rule the nests are excessively light structures, composed of a few slender sticks or grass-stems, or both, so loosely and sparsely put together that the eggs can generally be espied from below through the bottom of the nest." The eggs are two in number, and more elongated than the other species of Indian Doves' eggs, glossy, and generally of an ivory-white colour. They average in size 1·02 by 0·8 inch.

TURTUR PULCHRATUS.

(HODGSON'S TURTLE-DOVE.)

Columba pulchrata, Hodgs. in Gray's Zool. Miscell. p. 85 (1831).

Turtur orientalis (Lath.), Blyth, Cat. B. Mus. A. S. B. p. 236 (1849, in part); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 62; Dresser, B. of Europe, pt. lv. & lvi. (1876, in part).

Turtur rupicola (Pall.), Jerdon, B. of Ind. iii. p. 476 (1864); Blyth, Ibis, 1867, p. 149; Holdsw. P. Z. S. 1872, p. 467; Adam, Str. Feath. 1873, p. 390; Brooks, ibid. 1875, p. 256.

Turtur pulchrata (Hodgs.), Hume, Nests and Eggs, iii. p. 500 (1875); Butler & Hume, Str. Feath. 1876, p. 3; Hume (List Ind. B.), ibid. 1879, p. 110.

? *Turtur meena* (Sykes), Fairbank, Str. Feath. 1876, p. 262.

Adult (Nilambe). Wing 7·3 inches (abraded at the tip); tail 5·3 (abraded); tarsus 2·0; middle toe 0·95; bill to gape 0·9.

Iris orange (?); bill dusky slate, reddish at the base of the upper mandible; legs purplish red.

Head, back and sides of neck, and interscapulary feathers ashy, shading at the margins into dull rust-colour, which is most prominent below the nape and almost absent on the forehead; the interscapulary feathers slaty at the centres; back and rump ashy blue, pervaded on the upper tail-coverts with brownish, and the feathers there paling into rufous-grey at the tips; scapulars, lesser median, and inner greater wing-coverts black in the centre, passing with a slaty hue into broad *brick-red margins*; the outermost feathers of the lesser series, and nearly all the greater covert feathers, ashy blue, those adjoining the red-edged feathers shaded on the inner webs with rust-colour; primaries and secondaries slaty brown, pale at the tips and on the edge of the longer quills; winglet and primary-coverts darker brown than the quills; centre tail-feathers brownish ash, paling into grey at the tips, and tinged there with rusty; remaining feathers blackish, with broad slaty-white tips, the tip and outer edge of the lateral feather pure white.

Face and ear-coverts rusty ash-colour, passing on the throat and chest into rusty vinaceous, which pales gradually on the breast into vinaceous grey, and becomes albescent on the abdomen and almost *pure white* on the lower tail-coverts; chin whitish; flanks, axillaries, and under wing-coverts fine ashy blue.

Obs. In view of the present confused state of the synonymy of the Indian and Asiatic Red-winged Turtle-Doves, I adopt for our rare Ceylon visitant Hodgson's name of *T. pulchratus*, in doing which it seems to me that I cannot well err, inasmuch as Hodgson's bird was a Nepal specimen, and must, in all probability, have had white under tail-coverts.

There are two forms of these Rufous-winged Doves in India:—the one with whitish under tail-coverts, or *very pale* ashy, fading at the tips into whitish, which Jerdon and others call *Turtur rupicolus*, but which Mr. Hume thinks is better entitled to the name *T. pulchratus* of Hodgson; the other with uniform greyish-blue under tail-coverts, which Mr. Hume considers is the bird described by Sykes as *T. meena*, and which is apparently the same as the species (*T. gelastes*, Temm.) figured from Japan in Dresser's work, to accompany his article on *Turtur rupicolus*, or (as he uses an older title still) *T. orientalis*, Lath.

Latham unfortunately does not say what colour the under tail-coverts of his *T. orientalis* were. Mr. Dresser holds this species, however, to be identical with *T. gelastes*, Temm., from Japan, which has slate-blue under tail-coverts. I have seen the specimen he figures, and it closely resembles an example from Burmah in the national collection which Mr. Hume would, I think, refer to the bird described by Jerdon as *T. meena*, Sykes. Mr. Dresser writes me that he found such variations in the colour of the under tail-coverts in the specimens he examined that he was compelled to unite both forms under one title—*T. orientalis*, which appears to have been the first used.

To this decision Mr. Hume takes exception, and holds that in India the two forms are distinct, having a different distribution, the one being a resident form, while the other is migratory. He further remarks, in his valuable disquisition on the vexed subject (B. of Tenass. pp. 420–422), that though the sedentary species, *T. meena*, Sykes, undergoes, in its extension westward into a dry climate, a certain change (which is only to be expected), yet the

under tail-coverts are at all times distinct from the white, or nearly white, ones of the Himalayan migratory species.

It is thus satisfactorily demonstrated, I think, that there are two species in India. The dark under tail-coverted form is apparently the same as the Japanese; and if so must take the name of *T. gelastes*, Temm. Whether the other —which is the present species—is the same as *T. rupicolus* (*T. orientalis*?) I am unable to decide; but it is evidently the bird styled *T. pulchratus* by Hodgson.

I have compared the Ceylonese migrant, above described, with two specimens from Nepal in the British Museum. The first measures 7·8 inches in the wing (my bird would measure about 7·5 inches if the quills were perfect) and has the under tail-coverts very pale albescent ashy, with the tips whitish, in fact not so white, on the whole, as in my bird; the nape is more rufous and the chest more vinous. The second measures 7·4 inches in the wing, and the under tail-coverts are *very pale* bluish grey at the bases, and nearly white at the tips. Another specimen, from "North Burmah," has the under tail-coverts as pale as the Nepal birds; they are whitish ashy.

Jerdon's description of this species is unsatisfactory; he says it is "brown beneath, becoming whitish towards the vent," also "the back and rump ashy brown."

The European Turtle-Dove, *T. auritus*, of which the species here treated of are the Asiatic representatives, differs from them in being bluish on the head and nape, with the rufous edgings of the scapulars and wing-coverts of a different hue; these are more yellow-rufous than in our bird; the interscapular region is not so rufous, but more of a brownish grey; the breast has a very delicate hue, being of a pink vinaceous colour; the hind neck above the collar is slate-blue and not rufous. It is a smaller bird; wing about 7·0 inches.

An allied form to *T. auritus* is the Egyptian species *T. sharpii*, Shelley, which has the head pale yellowish brown instead of ashy, the chest "rich pink," and the rump, upper tail-coverts, and the two central tail-feathers "broadly edged with yellowish brown." Captain Shelley calls it a desert form of *T. auritus*. It is beautifully figured, pl. x., 'Birds of Egypt,' along with the European species.

Distribution.—This handsome Dove has proved to be an occasional straggler to Ceylon. Its first recorded appearance is that testified to in Layard's notes as follows:—"I shot a young bird of this species from a small flock of Pigeons which flew over my head as I was travelling with the late Dr. Gardner in the Pasdun Korale in the month of December, 1848." The locality and time of year mark this individual as a visitant to the island during the prevalence of the north or "long-shore" wind. In looking over a collection of my friend Mr. Bligh's at Norwich last year I detected an adult individual of this species; and on communicating with this gentleman he writes me from Catton as follows:—"The Dove *T. rupicola* was sent me in the flesh from Nilambe by Mr. G. S. Grigson, in 1871, during the cold season, and is the only one I have seen."

It is highly probable that on the two occasions in question not a few examples of this species visited the island, and in the north it may put in an appearance oftener than is supposed.

I identify Layard's specimen with mine and not with the allied species with dark under tail-coverts, simply because the birds that have visited Ceylon must needs belong to the migratory form; and the latter Mr. Hume proves to be a resident species in continental India. There is a specimen, if I remember right, in the Poole collection, but so faded that it would be impossible to say whether it originally had dark or light under tail-coverts; but I think we may, on the grounds here advanced, safely conclude it belongs to the race with the latter characteristic.

The bird with the white under tail-coverts, whatever its right classical name may be, is an inhabitant in summer of Nepal and the sub-Himalayas beyond Nepal towards the north-west. In the cool season it migrates to the south, chiefly avoiding the desert country of Rajpootana, according to Mr. Hume, although Captain Butler says that it occurs rarely at Mount Aboo, and Mr. Adam obtained it in the Sambhur district. It is found at Mahabaleshwar in the cool season, but does not seem to have been procured in the Nilghiris or the Palani hills. Now, however, that we know that it has strayed as far south as Ceylon, it must of necessity pass by these districts to reach the island, and no doubt, when the species reaches our limits, some few examples lodge in them. Mr. Ball does not record it from any of the eastern districts which he has worked, having only met with the allied bird with the dark under tail-coverts, which, being resident there, seems to replace it in that part of India.

Habits.—I glean nothing of note concerning the economy of this Dove from the writings of Indian

naturalists. Its habits appear to be similar to those of other Turtle-Doves. It feeds on seeds and grain, has a rapid flight and a deep-toned *coo.*

Nidification.—The lower ranges of the Himalayas as far east as Sikhim, and at elevations from 4000 to 8000 feet, form, according to Mr. Hume, the breeding-grounds of Hodgson's Dove. Captain Marshall writes that it breeds in pine-forests in June. It makes "a loose but rather more substantial twig nest than many of its congeners, placed on some horizontal branch of a large tree, usually not far from the extremity." The eggs are two in number, pure white and glossy, and measure 1·22 by 0·93 inch.

COLUMBÆ.

Fam. GOURIDÆ.

Bill usually lengthened; the gape not so wide as in Columbidæ. Wings moderate. Tail-feathers varying in number from 12 to 16. Legs and feet lengthened; toes slender, fitted for progression on the ground.

Of large size in some genera (*Goura*, &c.), with hackled feathers in one genus (*Calœnas*).

Genus CHALCOPHAPS.

Bill slender, straight; tip moderately curved. Wings moderate, the feathers pointed, and the 2nd and 3rd quills the longest and slightly sinuated on the outer webs. Tail of 12 feathers, compact, shorter than the wing, rounded. Tarsus slender, longer than the middle toe, bare to the knee, slightly reticulated; inner toe longer than the outer; hind toe rather long.

Of small size; clothing-feathers with the shafts broad and flattened. Feeding entirely on the ground.

CHALCOPHAPS INDICA.

(THE BRONZE-WINGED DOVE.)

Columba indica, Linn. Syst. Nat. i. p. 284 (1766).

Columba javanica, Gm. ed. Syst. Nat. i. p. 781 (1788).

Chalcophaps indicus (L.), Blyth, Cat. B. Mus. A. S. B. p. 234 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 62; Jerdon, B. of Ind. iii. p. 484 (1864); Walden, Ibis, 1873, p. 315; Hume, Str. Feath. 1874, p. 269; Ball, ibid. 1878, vii. p. 225.

Chalcophaps indica (L.), Kelaart, Prodromus, Cat. p. 130 (1852); Swinhoe, P. Z. S. 1871, p. 397; Holdsw. P. Z. S. 1872, p. 467; Legge, Ibis, 1874, p. 26, et 1875, p. 400; Salvadori, Ucc. di Born. p. 299 (1874); Walden, Trans. Zool. Soc. 1875, ix. p. 221; Hume, Nests and Eggs, iii. p. 509 (1875); id. Str. Feath. 1875, p. 165; Bourdillon, ibid. 1876, p. 404; Inglis, ibid. 1877, p. 40; Fairbank, *t. c.* p. 409; Hume & Davison, ibid. 1878, B. of Tenass., p. 424; Cripps, ibid. 1878, vii. p. 298.

Chalcophaps bornensis, Bonap. Compt. Rend. xliii. pp. 947, 949 (1856); Wall. Ibis, 1865, p. 393.

Chalcophaps javanica (Gm.), Wall. Ibis, 1865, p. 393.

The Green-winged Dove, Edwards, Nat. Hist. i. pl. 14; *Tourterelle de Java*, Buffon, Pl. Enl.; *Imperial Dove*, Sportsmen in India; *Green Pigeon*, "*Bronze-wing*," *Beetle-winged Pigeon*, *Ground-Dove*, *Ground-Pigeon*, Europeans in Ceylon. *Ram-ghughu* and *Raj-ghughu*, Bengal.; *Andi bella guwa*, Telugu; *Pathaki prāā*, Ceylonese Tamils; *Pomba verde*, Portuguese in Ceylon.

Nila kobœya, lit. "Green Dove," Sinhalese.

Adult male. Length 10·0 to 10·5 inches; wing 5·3 to 5·8; tail 3·3 to 3·5; tarsus 0·9 to 1·0; middle toe and claw 1·05 to 1·1; bill to gape 0·9.

Examples from the hills appear to average larger than those from the low country; I have not procured many, and it is probable that some may exceed 5·8 inches in the wing.

Iris dark brown; bill coral-red, dusky about the base; legs and feet purplish or dark coral-red.

Forehead and a broad stripe above the eye down to the side of the nape white, blending into the fine ashy blue of the crown; whole neck, throat, and breast rich vinaceous brown, paling on the belly into reddish grey; in some specimens there is a broad stripe of blue-grey from the nape down the centre of the hind neck, spreading out over the ruddy brown just above the interscapulary region; in others there is merely a wash of this colour down this part; interscapulars, scapulars, wing-coverts, the tertials, and the outer webs of the secondaries metallic emerald-green, beautifully illumined with a coppery bronze hue when viewed exactly from above; primaries and inner webs of secondaries brown, the basal portion of the inner margins cinnamon-red; lower back glossy sepia-brown, crossed by two broad bands of bluish white, the lower one blending into the dark ashy black-tipped upper tail-coverts, the dark interspace with a few small bronze spots near the tips of the feathers; tail cinereous blackish, the two outer pairs of feathers bluish white at the base and tipped with the same, having a broad subterminal blackish band; under tail-coverts at the sides bluish ashy, in the centre concolorous with the tail, tipped with bluish ashy; under wing-coverts cinnamon-red, and along the upper edge of the ulna the anterior webs of the feathers are pure white, changing to bluish ashy at the flexure of the wing, and forming a white shoulder-patch.

Female (low country). Length 9·2 to 9·5 inches; wing 5·1 to 5·3; legs and feet dusky red: bill not so bright as in the male.

Supercilium and forehead not so white as in the male, but overcast with bluish, and passing on the crown and nape into the deeper blue of the tips of the feathers, the bases being ruddy brown; the throat and fore neck are light chocolate-brown, passing into ruddy whitish on the chin and lower breast, and darkening on the hind neck into a

browner hue than the chest, with a trace of bluish in some specimens on the lower part; green portions of the upper surface more overcast with bronze than in the male; the pale rump-bands narrower; the upper and under tail-coverts and the tail warm ferruginous brown, the upper tail-coverts tipped with blackish, the lower with bluish grey; the three outer tail-feathers with a subterminal band of blackish, and the two outer pairs bluish at the base and tips.

Young (nestling: Travancore). "Warm brown above, with all the feathers except those of the head and quills broadly tipped with chestnut, and with a coppery-green lustre on the scapulars and the outer webs of the tertiaries and later secondaries, and with all the primaries margined with chestnut; below duskily barred with chestnut." (*Bourdillon.*)

Obs. I have not had an opportunity of comparing South-Indian examples of this Pigeon with those in my collection from Ceylon, and I am therefore unable to say whether such slight differences exist between the birds from these two localities as are perceptible in those which I have examined from a number of other places throughout its range in the Malay archipelago. As regards the size of those nearest to Ceylon on the mainland, viz. specimens from South Travancore, Mr. Bourdillon gives us the following data:—*Male*, length 10·25 inches, wing 6·1, tail 3·75, tarsus 1·06; *female*, length 10·0 inches, wing 5·75, tail 3·75. These dimensions exceed considerably those of every Ceylonese specimen I have measured; the bird is, however, a variable one in size as well as in its tints, and these may have been exceptionally large examples; a female from North India, collected by Capt. Pinwell, corresponds fairly with a specimen in my collection. Mr. Hume remarks that Thayetmyo specimens are identical with those from all parts of India, Tenasserim, the Andamans, and the Nicobars. The bird from the latter region was separated by Bonaparte as *C. augusta*; but Mr. Hume fails to find any valid difference in it from those obtained in the Andamans or India; and he remarks that the specimens from these islands have the rump-bands somewhat less strongly marked than in continental birds, and the white frontal band somewhat narrower. He further states (what I have myself observed in Ceylon specimens) that the bluish-grey stripe down the centre of the hind neck is an uncertain character, and has no reference to the breeding-season.

The Javan bird, *C. javanica*, Gmelin, which Wallace united (*l. c.*) with the species inhabiting Borneo, Flores, Lombok, and Sumatra, was originally considered distinct; but it is now admitted to be identical with the Indian, Malaccan, Formosan, and Philippine form. Examples I have seen from East Java are more purplish on the under surface than my Ceylon skins, the abdomen is not so pale, and there is more of the bronze tipping to the feathers of the upper rump-band. In one specimen the green of the back is less illumined with bronze: ♂, wing 5·8 inches, tail 4·0. The Celebean bird is likewise identical with the Javan.

Allied species are:—*C. cyaneopileata*, Bonnaterre, = *C. moluccensis*, G. R. Gray; *C. timorensis*, Bonap.; *C. stephani*, Homb. & Jacq.

C. cyaneopileata is nearest to the Javan and Indian bird. It is redder on the throat, neck, and breast, and the abdomen is darker; back more coppery, and the inner webs of the quills more covered with cinnamon-red and also of a brighter hue: ♂, wing 5·7 inches. The female, which I have not seen, is said by Wallace to have the head and upper part of the back earthy brown.

C. timorensis is a larger bird, and the *male* has no white forehead or eye-stripe, the head being vinaceous down to the base of the bill; back as in *C. indica*; the primaries with more cinnamon-colour, extending to the outer webs of the shorter feathers; lower parts redder than in our bird: wing 6·2 inches. The *female* has the head and hind neck coppery brown and the forehead ashy; tail coppery chestnut-colour, the lateral feathers bluish grey, with dark terminal bands.

C. stephani is ashy chestnut beneath; upper tail-coverts and tail chestnut-red; an olive-black rump-band, bounded above by a fulvous band, and beneath by a rufescent one; forehead white; back chestnut: wing, ♂, 6·0 inches. This is a very distinct species inhabiting North Celebes.

C. hombroni, another species described by Wallace, is smaller than *C. stephani*; "the forehead is slate-brown, and the lower back black, with two yellowish bands; middle and larger wing-coverts and ends of the tertiaries golden green."

Distribution.—This beautiful Pigeon is chiefly an inhabitant of the damp forests and well-watered wooded districts of Ceylon; but yet its habits are so essentially sylvan that it is found all through the forests of the northern half of the island. In the woods and jungles of the Western Province it is a common bird, being especially partial to bamboo-cheena, and it is consequently abundant throughout Saffragam and in the well-covered hills of the south-western portion of the island. In forest districts, such as the Kukul Korale and Pasdun Korale, it is very numerous. It is well diffused throughout the Central Province, being found up to

the altitude of Nuwara Eliya, but more particularly during the N.E. monsoon. Mr. Holdsworth says that at the end of the year it frequents the woods at the Sanatarium in great numbers. I am under the impression it inhabits the Horton-Plains jungles at this season; but I did not make a note of it when I was there.

In the south-east of Ceylon, and likewise in the Eastern Province, wherever the jungle is hot and dry, it confines itself to the forest on the banks of the rivers. In the Trincomalie district and throughout the northern forests it may be met with anywhere; but it is not so numerous as in the southern part of the island.

On the mainland the distribution of this Pigeon is for the most part easterly; it is common in the wooded districts of the south, such as Travancore, the Palanis, and the Nilghiri jungles; but it avoids the Deccan, and is not found in the north-west portions of the empire. Neither Mr. Hume nor Captain Butler notice its occurrence in the direction of Sindh. It is said to be abundant in the Dhoon up to 5500 feet, and affects jungle-clad hills in Central and Eastern India up to an elevation of 6000 feet. In his article on the avifauna of Chota Nagpur Mr. Ball says it is a bird of extreme rarity in the province; he met with it once in a forest in Gangpur, and once in the Rajmehal hills. In his subsequent article on the district extending to the Godaveri he records it from Sambalpur and Orissa on the north of the Mahanadi. In Furreedpore it is rare, and likewise in North-eastern Cachar; but in Upper Pegu Mr. Oates records it as tolerably common in evergreen forests on the hills. Dr. Armstrong did not meet with it in the Irrawaddy delta; but southward in Tenasserim it is generally distributed throughout the wooded portions of the province up to 4000 feet. In the Andaman and Nicobar Islands it is likewise generally distributed, and very numerous in some localities of the former according to Mr. Davison. It extends down the Malay peninsula to Sumatra and Java, in the forests of both of which islands it is plentiful. Mr. Wallace is of opinion that it may have been introduced into India from the latter island, as communication between the two places has long existed, the Hindoo religion having been established in Java for an unknown period prior to its being subverted by Mahommedanism in the fifteenth century. The fact of the genus being entirely a Malayan one, and this species being the only member of it in India, certainly fosters the belief that it may have been so introduced; but, on the other hand, it may have made its way across to the Malay peninsula from Sumatra, and thence spread over the tracts it now inhabits on the mainland. It inhabits Borneo throughout, having been procured at Banjermassing on the south coast, at Sarawak and other places on the western side, and at Labuan on the north. Thence it extends to the Philippines, where it is not uncommon in Negros and in the most northerly of the group—Luzon.

It is likewise found in Formosa, and perhaps along the coast of South China, for it has been recorded from Hainan by Swinhoe. Blyth states that M. Mouhot obtained it in Cambodia; and this is quite probable, as it would extend thither through Siam from the Malay peninsula. Eastward of Borneo it has been obtained in Celebes, and southward in Flores and Lombok.

In Ceram, Borneo, Amboyna, and other Moluccan islands the allied species *C. moluccensis*, Gray, is found; but it is probable that the present species may also be obtained in some of these localities.

Habits.—The "Bronze-wing," which is the handsomest of its family in Ceylon, is rarely seen away from wood; it is entirely a denizen of jungle, and is so often seen on forest-paths and roads, that it is well known to all who travel in the interior. Its swift arrow-like flight, seen to advantage as it darts over one's shoulders on its swift course down some forest-path, its brilliant plumage and upright carriage as it quickly walks hither and thither on the pathway, letting the spectator approach it so closely that its bright red bill and soft eye may easily be seen, and its melodious though deep unpigeon-like *coo*, all combine to make it one of the most favourite of Ceylonese birds. It is, however, not always so tame; in the early morning, when first commencing to feed, it is the reverse of shy, but when I have seen small parties of three or four feeding at the edges of clearings or paddy-fields in the afternoon they were difficult to approach. It is in its element in bamboo-jungle, and wherever this abounds it is very plentiful and rarely seen out of the woods filled with this undergrowth. In the breeding-season the bamboo-chenas clothing the hill-sides in Saffragam and the Rayigam and Hewagam Korales resound in the evening with the *coo* of this Dove. It feeds on seeds, and I have occasionally found bulbous roots in the stomachs of specimens I have shot.

Layard well describes its habits in the following paragraph:—"Being a bold, fearless bird of great power of wing, it will permit approach to within a few paces, when, with a spring into the air, it will dash onwards a few dozen yards, and again settle; a renewed approach drives it further off a second and a third time, till driven

beyond the range of its food, the lovely bird will dart back to its old feeding-ground with the rapidity of thought, often brushing the intruder's person with its wings, while following the tortuous narrow windings of the native path."

Mr. Davison writes :—" They are not in general shy, and will walk on in front of one for some considerable distance if not closely pressed. They rise with a sharp flutter of the wings, and their flight is very rapid indeed. When disturbed they generally fly some considerable distance before alighting, sometimes on the ground, more generally on a tree at no great elevation from it. Their note is a low mournful one and can be heard from a long distance. It sounds like the word '*oo*' very much prolonged and slowly uttered with a booming sound." This note is more like that of an Owl than a Pigeon, and were it not heard during the daytime would unmistakably be taken for that of a night-bird.

Nidification.—In the Western Province I have shot the "Beetle-wing" in a state of breeding in June; but I have taken its eggs in the Kurunegala district in February, so that it probably breeds at no regular period and very likely has more broods than one in the year. The nest I found was near Dyatura, built at the extremity of the lateral branch of a small tree at about 6 feet from the ground. It was made of small sticks, and slightly more cup-shaped than that of a true Dove (*Turtur*). It contained two eggs, regular ovals in shape, and of a warm buff or cream-colour. They unfortunately got broken before I measured them; but Layard, who describes the eggs as yellowish-drab colour, gives their dimensions as 12 lines (1·0 inch) by 8½ (0·71 inch). There is probably an error in the latter dimension. Mr. Hume describes the nests as more regular saucers than those of the Doves, composed of roots, grass, or twigs, but comparatively neat and devoid of lining, with a decided central depression. It breeds in India from February till July. The eggs are said by this gentleman to vary from creamy white to white, and to measure from 1·0 to 1·1 inch in length by from 0·82 to 0·86 inch in breadth.

COLUMBÆ.

Fam. TRERONIDÆ.

Bill with the gape very wide, in most short and thick, the tip strong and much vaulted. Wings long, the primaries pointed. Tail moderately long, of 14 feathers. Tarsus short, reticulated in front, feathered below the knee. Toes short and very broad, fitted for grasping.

Of frugivorous habit; entirely arboreal.

Genus CARPOPHAGA.

Bill rather long, flattened, the gape very wide, the corneous tip short; frontal feathers advancing much on the base. Wings long and pointed, the 3rd quill the longest, and the 1st rather short, slightly exceeding the 6th. Tail tolerably long and rounded. Tarsus short, very stout, feathered for half its length, the bare portion shielded with broad scutes. Toes very stout and broad at the base, lateral toes subequal. Claws very stout and curved.

Of large size and brilliant metallic plumage on the back and wings.

CARPOPHAGA ÆNEA.

(THE IMPERIAL GREEN PIGEON.)

Palumbus moluccensis, Briss. Orn. i. p. 148. no. 41 (1760), "ex Moluccis insulis."

Columba ænea, Linn. Syst. Nat. i. p. 283. no. 22 (1766) (*ex* Brisson).

Columba sylvatica, Tickell, J. A. S. B. 1833, p. 581.

Carpophaga ænea, G. R. Gray, Gen. of B. p. 468 (1844); Sclater, P. Z. S. 1863, p. 221; Wallace, Ibis, 1865, p. 383; Walden, Ibis, 1873, p. 314; Hume, Str. Feath. 1874, p. 260; Ball, *t. c.* p. 424; Legge, Ibis, 1874, p. 399; Salvadori, Ucc. di Born. p. 290 (1874); Walden, Trans. Zool. Soc. 1875, ix. p. 215; Hume, Nests and Eggs, iii. p. 496 (1875); id. Str. Feath. 1875, p. 163; Ball, ibid. 1876, p. 235; Armstrong, *t. c.* p. 337; Inglis, ibid. 1877, p. 39; Ball, *t. c.* p. 418; Hume & Davison, ibid. 1878 (B. of Tenass.) p. 417; Ball, ibid. vii. p. 224; Hume, List Ind. B., ibid. 1879, p. 109.

Carpophaga sylvatica (Tick.), Blyth, Cat. B. Mus. A. S. B. p. 231 (1849); Kelaart, Prodromus, Cat. p. 130 (1852); Jerdon, B. of Ind. iii. p. 455 (1864); Wallace, Ibis, 1865, p. 383 (in part); Blyth, Ibis, 1867, p. 148; Swinhoe, P. Z. S. 1871, p. 396; Holdsw. P. Z. S. 1872, p. 466; Legge, Ibis, 1874, p. 24.

Carpophaga pusilla, Blyth, Cat. B. Mus. A. S. B. p. 232 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 58; Blyth, Ibis, 1867, p. 148 (in part).

Pigeon Ramier des Moluques, Temm.; *Imperial Pigeon*, Sportsmen in India; *Large Green Pigeon, Wood-Pigeon*, Europeans in Ceylon. *Dunkul, Doomkul, Sona kabutra, Burra harrial*, Hind.; *Pogonnah*, Malyalum; *Kakarani guwa*, Telugu (Jerdon); *Berg Duyven*, Dutch in Ceylon (Layard); *Maratham prāā*, Tamils in North of Ceylon.

Maha nila goya, lit. "Large Green Pigeon," Sinhalese; also *Matabatagoya*, Sinhalese north of Kandy (Layard).

Adult male and female. Length 15·5 to 16·2 inches; wing 8·0 to 8·6, expanse 27·0; tail 5·2 to 5·7; tarsus 1·0 to 1·1; middle toe and claw 1·7 to 1·75; bill to gape 1·3 to 1·35.

Individuals of both sexes vary much in size. It is probable that some birds range beyond 8·6 inches in the wing. Lord Tweeddale gives the wing-measurement of three Ceylonese examples as 8·25. Mr. Hume states the average to be 8·0; this is, however, the minimum dimension; 8·3 is about the average.

Iris carmine-red; eyelid arterial red; bill with the basal part greyish green and the tip light bluish, sides of the lower mandible purplish; legs and feet dull lake-red, soles yellowish; claws olive.

Head, neck, throat, and under surface delicate bluish grey, purest on the chest and palest on the abdomen, and more or less suffused with vinous grey about the face and on the hind neck and breast; chin, forehead close to base of bill, and an orbital circle whitish; back, rump, upper tail-coverts, and wings metallic green, with a bright coppery lustre, and pervaded with ashen *when viewed against the light*; primaries deep plumbeous, suffused with green, the outer webs with a greyish hue; tail deep slaty green, the margins and tips of the feathers being shining green, passing into obscure or slaty green at the shafts; lateral feathers paler than the rest; under surface of tail yellowish grey and the shafts pale; under tail-coverts liver-colour or deep chestnut; thighs albescent internally, pale lilac, like the abdomen, externally; under wing-coverts slate-grey.

Young. Immature birds are said to have the under tail-coverts paler than adults. Mr. Davison remarks that they are just as brightly glossed on the back, wings, and tail, but want the vinaceous tinge below.

Obs. The Imperial Green Pigeon (*C. sylvatica*) of India was long considered distinct from the Philippine and Malayan-Archipelago species *C. ænea*. The late Marquis of Tweeddale, however, after a comparison of a large series from

the Philippines, Java, Sumatra, India, Burmah, and the Andamans, united the two races under the Linnean title. I have compared examples from Hainan, Java, Sumatra, Andamans, Lombok, Borneo, Negros, and Madras with Ceylonese skins, and am fully convinced that there is but the one species of this particular Pigeon, which varies greatly in size in different localities, the smallest race inhabiting Ceylon and South India, and the largest birds being found in Burmah, Borneo, Lombok, and the Philippines (those from the latter locality exceeding all others), and which is likewise subject to variation in the coppery hue of the back and the vinous tinting of the under surface, but unaccompanied by any corresponding alteration in the distribution of colour, and not in such a systematic way as to warrant the discrimination of any of the most aberrant specimens as distinct species.

A Madras example which I have compared with my Ceylonese skins has more white round the gape and on the chin (a variable character, however), back and wings slightly more coppery, and the under surface more suffused with vinaceous. An Andaman example (wing 8·9) and one from Sumatra (wing 9·2) are more vinaceous on the nape than my birds, but the white of the forehead, the green of the back, and the tints of the under surface are the same. The Andaman bird has a good deal of white on the chin. Mr. Hume says that, as a race, the birds from these islands are very large, and greener with deeper-coloured under tail-coverts and whiter foreheads than continental birds. He gives the wing-measurement at 8·5 to 9·5 inches. Lord Walden's measurements (Ibis, 1873) of seven specimens are 8·5 to 9·25. Two females from Sarawak measure 8·8 and 9·1 respectively in the wing, have the green of the back less coppery and the underparts more vinaceous than Ceylon skins, but are otherwise the same. The reddish tinge of the under surface is doubtless a mark of age, as we have seen from Mr. Davison's description of a young bird. A Lombok example measures 9·5 inches in the wing, and is identical with one of mine from Saffragam. Birds from the Philippine Islands have a stronger coppery lustre on the back than any I have seen; the hind neck is less vinaceous too, the abdomen and lower breast are more vinaceous than the chest, and the primaries, as in Sumatran and Bornean birds, have a very strong grey tinge on the outer webs: wing 9·7 inches. A Hainan specimen corresponds well with one from Madras; it is slightly ruddier on the head: wing 8·9. A Burmese skin is extremely red on the lower parts: wing 9·5. I observe that all these long-winged birds from various localities appear to be no larger in head and feet than smaller-winged individuals, and, further, that they have not the tail proportionately lengthened; the primaries are simply more or less attenuated, *the tips thus prolonged causing the extra length of wing*. Ceylonese and South-Indian birds have the tips of the primaries peculiarly round in comparison to the large examples in question. Mr. Hume finds the average of Anjango birds to be 8·25 inches in the wing, and of Calicut and Nilghiri 8·5 to 8·75. Blyth described the birds inhabiting South India as a smaller race under the title of *C. pusilla*, and placed Layard's Ceylonese specimens with it: but Jerdon did not consider it distinct from Tickell's bird from Central India, and states that Blyth's name was founded on a peculiarly small specimen.

This genus of magnificent Pigeons—the princes of their family, the Treronidæ—is a very extensive one, extending from India through the Malay archipelago, where it is chiefly developed, to Australia and New Zealand. In the archipelago there are not a few species resembling the present, some of which are characterized by a knob at the base of the bill, much developed in the male at the breeding-season: these form Bonaparte's division *Globicera*. The under tail-coverts are liver-coloured in all the allied forms.

C. paulina, Temm., a Philippine species found in Menado, has a bright reddish nape, and the face, head, and throat vinaceous. It is allied to *C. ænea*, but easily distinguished by the characters mentioned. Wing of a specimen from Menado, 8·5 inches.

C. pacifica (Gm.) is a fine species, allied to the present and seemingly very close to it; the head and hind neck are of a different grey colour; the back and wings much as in *C. ænea*. A Samoan example has the wing 9·4 inches.

C. neglecta, Schleg., a Moluccan form, is larger than *C. ænea*, the back, rump, and wings brighter green, the head, throat, and under surface grey, not tinged with vinaceous. Wing 10·0 inches, tail 6·6 (Ceram).

C. tumida, Wallace. Back and wings deep bronzed green; head, entire neck, and underparts delicate grey, tinged with vinaceous on the hind neck, breast, and belly; at the base of the upper mandible is a large knob. Wing of a Waigiou example 9·5 inches. Belonging to another group are *C. insularis*, Blyth, from the Nicobars, and *C. perspicillata* from Bouru. The former is larger than *C. ænea* on the whole, and has the under tail-coverts dingy brown, which constitutes its chief difference. A new species (*C. palumboides*, Hume) from the Andamans belongs to another subgroup; it has the lower parts dusky slate-blue, the under tail-coverts *blackish*, and the head and face pale grey.

The fine Bronze-backed Imperial Pigeon, *C. cuprea*, Jerd., of Southern India, and its northern representative, *C. insignis*, Hodgs., belong to quite another group, and are inhabitants chiefly of mountainous regions. It is a matter worthy of comment that the southern bird or an insular representative of it has not been found in our mountains. *C. cuprea* is an abundant species, according to Mr. Bourdillon, in the Travancore hills.

Distribution.—This magnificent Pigeon is exceedingly abundant in all the well-wooded and forest-clad

portions of the low country. Proceeding inland from Galle it is first met with beyond Baddegama and in the forest of Kottowe, becoming more numerous towards the Oodogamma and Opaté hills, in the higher parts of which, however, it is not so common as in the valleys. Further north, some miles inland, east of Kalatura and Bentota, it becomes plentiful, and continues so all through the Pasdun and lower portions of the Kukul Korale to Saffragam, which is its great stronghold in that part of the island, and in which (above Gillymally) I have traced it to an elevation of about 1500 feet. In the south-east it avoids the scrub-country along the sea-coast, except where it is cleft by the forest-clothed banks of the rivers; but it is very abundant at the back of this region up to the base of the Uva hills. In the Friars-Hood group it is common. In the northern half of the island it is pretty evenly distributed throughout the jungle which covers the whole of that part. I have met with it in all parts which I have visited, and Mr. Parker has found it in the Madewatchiya and Anaradhapura districts. Along the rivers in the Seven Korales it is abundant.

I have never been able to obtain any information concerning this bird being found in the higher jungles; I have not myself seen it above an altitude of 1500 feet; and Mr. Bligh has not met with it in the higher regions of the Kandyan zone; numerous inquiries which I have made have all failed in disclosing any locality in the coffee-districts inhabited by it. I conclude, therefore, when Layard writes that its "great haunt is certainly the mountain-zone," he refers to the base of the Kandyan hills, and not the upper parts.

According to Jerdon it is not at all a mountain species in India; he remarks that he cannot call to mind having seen it as high as 2000 feet, and that it is more abundant at elevations from the level of the sea up to 1000 feet. This is exactly the case in Ceylon. "It is only found," he writes, "in forest countries, and is very abundant in the Malabar jungles, in Central India, Midnapore, and the wooded countries to the north-east generally." It appears to avoid the Deccan entirely, passing up to the north-east from the forests of Southern India, and inhabiting the Godaveri valley, Orissa, Jaipur, Singbhum, Maunbhum, Midnapur, and the Rajmehal hills. It does not appear to extend across to Western India at all. Mr. Blanford says that he did not meet with it in the valleys of the Nerbudda or Taptee; and Mr. Ball did not meet with it in Western Chota Nagpur even; further south, however, its range extends up the Godaveri valley to Sironcha and Chanda; but this appears to be only an isolated branch of extension, and northward of this river its visit to the west would be defined by a line drawn through the Jaipur district to Sambalpur, and thence northwards through eastern Chota Nagpur to the Rajmehal hills. How far it extends through the forests at the base of the Western Ghâts towards the north I am unable to say; but the Rev. Dr. Fairbank did not meet with it about Mahabaleshwar, which proves pretty clearly that is confined to the south. Northward of the Rajmehal hills we find it in Nepal, and thence eastwards into Cachar, where Mr. Inglis says it is common, breeding during the rains. Southward we find it in the Arrakan hills, and eastward in Pegu. Mr. Oates records it as common both in the hills and the plains, whence it extends to the sea-coast at the mouths of the Irrawaddy, where Mr. Armstrong tells us it occurs sparingly. In Tenasserim it is generally distributed, according to Messrs. Hume and Davison, throughout the better-wooded portions of the province, but does not ascend the hills. In the Andaman group Mr. Davison found it abundant in December; but later on, in April, it had become scarcer, owing, as he suggests, to the then scarcity of wild fruits which abound in December and January. Throughout the Malay peninsula we may conclude that it occurs in suitable places, which brings us to Sumatra, of which island it is an inhabitant, although, with our scanty data concerning the avifauna of this great island, it would be impossible to speak with certainty concerning its distribution there. Both Raffles and Wallace record it, probably from the southern coast; but Mr. Buxton did not meet with it in Lampong. The latter naturalist and Horsfield notice its occurrence in Java, and in Borneo it has been found in Banjermassing, Sarawak, and other maritime provinces. From Java eastward it probably extends through all the chain of islands towards Timor, for it has been obtained in Lombok, Sumbawa, and Flores. From Borneo towards the north it ranges into Palawan, and thence through the Philippine group. In Hainan, Swinhoe procured it in the central and western portions of the island. Data are now desirable concerning the vast stretch of country between Burmah and this latter locality, which it doubtless will be found to inhabit.

Habits.—The "Maha nila goya," the finest Pigeon in Ceylon, is a denizen of wild forest and jungle-clad districts, the fruit-bearing trees of which afford it such ample sustenance that in some parts of the island it abounds to an equal extent with the very numerous Maroon-backed Pigeon presently to be noticed. Though

very shy when feeding it may easily be shot when wending its way across country in flights to drink in the morning or to roost in the afternoon. At such times a regular stream of these birds will continue to cross a road in the Eastern Province for perhaps half an hour together, and they afford very good shooting. It is well styled, together with all its genus, "Imperial Pigeon." On the wing, when dashing into a forest-glade in the Pasdun Korale or Saffragam, or sweeping across an opening in the dense jungle of the Park country, it is a splendid bird, and to the hungry sportsman by no means to be despised for the table. Indeed, if kept for a couple of days in the dry hot districts of the island, it becomes very tender, and its flesh is then almost equal to that of the succulent smaller Fruit-Pigeons, the "Batta-goya" of the Singhalese.

There is something quite startling in its grand guttural note, when heard uttered from the top of a tall tree in the forest ravines of Southern Ceylon; it resembles the syllables *wuck-wōōōr*, the last having a deep sepulchral sound. Mr. Ball, who calls it a deep sonorous *coo*, which he represents by the words *wuh, wooh*, says "there is something weird about it when heard resounding through the valleys." When feeding, like other Pigeons they are silent, and it is generally about 10 o'clock in the morning, when sitting motionless, a few perhaps together near the top of a tree, that they utter their *coo*. They are most difficult to see when the spectator is approaching them from behind, as their green plumage assorts so well with the surrounding verdant foliage. It is a gluttonous fruit-eater, swallowing its food whole, and is perhaps fonder of the berries of the Bo-tree (*Urostigma religiosum*) and of the "Palu" or "iron-wood" (*Mimusops indica*) than those of any other trees. In the south-east of Ceylon both these trees are to be found growing by themselves among small scrubby jungle and towering far above it; and when in fruit, Pigeons flock to them from all sides until the branches are literally laden with them. In Saffragam I found them feeding on the wild cinnamon-fruit, and also on wild nutmegs, which their enormous gape enables them to swallow with ease. The nutmeg is, of course, as in the case of the Myna, voided after the mace has been digested; and Mr. Davison remarks that, "in Southern India, this is so well known, and the good taste of the birds, who always select the ripest and the finest fruit, so thoroughly relied upon, that people are sent round to collect the nutmegs thus discarded by these Pigeons, as these are the best and can most be relied on for seed." The reason for this singular practice is, he writes, "that birds and animals only eat the perfectly ripe fruit when they have a large choice, and that the seeds of these germinate more freely than the more or less unripe ones of which the coolies are certain to gather so many."

It is remarked by Jerdon that in the hot weather they resort to the salt swamps of the Malabar coast to feed on the buds of *Avicennia*.

The stout feet possessed by these Pigeons enables them to walk freely along the branches, or hold on firmly while reaching out at their food. It is said to erect the feathers of its head and neck when wounded; and Mr. Ball says that, when doing this, it looks double its natural size, and strikes out violently with its wings. Mr. Davison, who notices, with reason, the loud "*put-put-put*" made by their powerful wings when they dash out of a tree, says they are not quarrelsome, like many Green Pigeons, but, on the contrary, are sociable and gentle together.

Nidification.—Considering that this Fruit-Pigeon is so common, it is surprising that so little has been written about its nesting. I am not aware that its nest has been taken by any naturalist in Ceylon; but I am able to state that it breeds in April and May in the south of the island, as I shot a female on the 28th of the former month at Baddegama, in the oviduct of which was an egg almost ready for expulsion. Mr. Inglis states that a nest he saw in North-eastern Cachar was built about 30 feet from the ground, and consisted of "a very few sticks and a few stiff grasses." It contained two young birds. Two eggs, sent by Captain Wimberley to Mr. Hume from the Andamans, were broad ovals, obtuse at both ends, pure white, with a slight gloss, and measured 1·6 by 1·25 inch. Jerdon speaks of a Shikaree informing him that he had found a nest with two eggs; so that there seems quite evidence enough to show that this species differs from most other members of the genus, who only deposit a single egg.

Genus CROCOPUS*.

Bill short, stout, very deep for its length, the soft base occupying about a third of the length of the culmen, which is boldly curved at the tip; gonys deep. The longer primaries very much pointed; the 3rd quill with a large sinuation†. Tail moderately long, rounded at the tip. Tarsus short, stout, feathered for a third of its length; middle toe longer than the tarsus; outer toe considerably longer than the inner; claws deep and curved.

CROCOPUS CHLORIGASTER.

(THE SOUTHERN GREEN PIGEON.)

Treron chlorigaster, Blyth, J. A. S. B. 1840, xii. p. 167; id. Cat. B. Mus. A. S. B. p. 229 (1849); Kelaart, Prodromus, Cat. p. 130 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 57.

Treron jerdoni, Strickland, Ann. & Mag. Nat. Hist. 1844, p. 167.

Crocopus chlorigaster, Jerdon, B. of Ind. iii. p. 448 (1864); Holdsw. P. Z. S. 1872, p. 465; Adam, Str. Feath. 1873, p. 390; Ball, ibid. 1874, p. 423; Hume, Nests and Eggs, iii. p. 492 (1875); Butler & Hume, Str. Feath. 1876, p. 2; Fairbank, *t. c.* p. 261, et 1877, p. 408; Ball, ibid. 1878, vii. p. 224.

The Large Green Pigeon, Kelaart.

Hurrial, Hind.; *Pacha-guwa*, Telugu; *Pacha-pora*, Tamil (Jerdon); *Patchi-prāā*, Ceylonese Tamils (Layard).

Adult male (Behar). Length to forehead (from skin) 11·75 inches; wing 7·25 to 7·4; tail 5·0; tarsus 0·8; middle toe 1·05; bill to gape (straight) 0·95.

Female ("Madras"). Wing 6·7 inches; tail 4·3.

Jerdon gives the wing at "barely 7 inches; tail 4·75."

Iris carmine, with a blue inner circle; bill whitish; legs and feet chrome-yellow.

Forehead, entire top and the sides of the head, including the ear-coverts, dusky bluish grey, changing on the lores and lower cheeks into the impure green of the chin and throat; fore neck and chest olive-yellow, passing in a broad collar round the hind neck, beneath which there passes across the lower hind neck a collar of paler bluish grey than the head; back, scapulars, rump, upper tail-coverts, tertials, and wing-coverts yellowish olive-green, with a slaty tinge on the upper tail-coverts; point of the wing and adjoining portion of the lesser wing-coverts lilac; greater wing-coverts slaty green, with yellowish-white edges and tips; primaries and secondaries slaty brown, edged outwardly with yellow, except towards the tips of the longer primaries; tail slate-colour, the central feathers at the base and the remainder on the inner webs at the base tinged with green; breast yellowish green, slaty on the flanks, and changing into yellow on the abdomen; thighs yellow; under tail-coverts greyish crimson,

* The "Green Pigeons" are removed by Jerdon from the larger Pigeons (Carpophaginæ) and placed in a separate subfamily (Treroninæ). Both are, however, essentially *Fruit-Pigeons*, and have precisely the same habits. The distinctions pointed out, which consist in the thicker bill and shorter tail, are, in my opinion, only *generic*. I have, moreover, throughout my work (*which is intended solely for the benefit of students of ornithology in Ceylon*) avoided a complication of the subject by *not* taking *sub*families into consideration more than I could possibly help.

† This is only fully developed when the bird is adult. I have a young example of *Osmotreron pompadora* in which there is only an indication of it; and the same holds good with other species of this group I have examined in the British Museum. It is, however, absent in *Sphenocercus*, the Kokla Green Pigeon, a curious Himalayan form with a pointed wedge-shaped tail.

very broadly edged and tipped with dull white; under wing-coverts slaty, tinged with green; lower thigh-coverts slaty green, edged with white.

Female has the yellow of the hind neck dusky and that of the chest greener than in the male; point of the wing and the edges of the adjacent lesser coverts lilac; shorter under tail-coverts greenish slate, the longer feathers as in the male, and the whole similarly edged.

Obs. This species is very closely allied to the northern Green Pigeon, *C. phœnicopterus*, which is said by Jerdon to be larger (wing from 7·2 to 8·0 inches), and has the forehead and head strongly tinged with green, and the blue of the crown less decided, the lilac wing-spot larger, the centre of the lower breast and abdomen bright yellow, the tail greenish at the base. Two examples of this species in the British Museum, collected by Capt. Pinwell, measure 7·3 and 7·6 inches in the wing. One has a pure slate-coloured tail, with *no green at the base.*

C. viridifrons, Blyth, from Burmah, Pegu, and Tenasserim, is an exceedingly handsome species of this genus. A male (Burmah) measures—wing 7·25 inches; tail 4·5; bill to gape 1·6. The forehead and front of crown, lores, face, and throat olive-green; occiput, nape, and ear-coverts slate-blue, sharply defined against the green; yellow collar broader than in *C. chlorigaster*, and the yellow of the chest richer; more than the basal half of the tail olive-yellow, defined against the broad, dark, slate-coloured terminal band; breast and flanks delicate slate-blue, clearly defined against the yellow chest.

Distribution.—This fine Pigeon I was never fortunate enough to meet with. It appears to inhabit (or visit, according to Layard) the extreme north of the island; and there are two specimens of his collecting in the Poole Museum. He states that "it is migratory, only appearing in the fruit season, and returning again to the coast of India." Mr. Holdsworth procured it near Aripu on the north-west coast, so that it would not appear to be entirely confined to the extreme north. I searched diligently for it in the Trincomalie and north-central districts, but never saw it. It probably inhabits the forest country stretching from the Elephant Pass south-westwards to the gulf of Manaar; but why it should restrict itself to that part of the island it is hard to say. That it migrates to the island in the fruit season is, I think, scarcely a tenable hypothesis, for all our visitors (those which come in any number) are regular migrants influenced by the ordinary instinct, and moving southwards in the cool season. The banyan-fruit is, I think, chiefly ripe in March, April, and May, which would scarcely be the time when any species would visit our shores.

Jerdon writes that this species replaces the Bengal Green Pigeon throughout the greater part of the peninsula of India; he considered it to be rare north of the Nerbudda, though occasionally killed in Lower Bengal. It is, however, found, according to Capt. Butler, throughout the plains of Northern Guzerat, "in all well-wooded districts"; and Mr. Hume adds that it occurs throughout all the surrounding region, though very rare in Sindh, in which province it has only recently been procured at Jacobabad by Mr. J. A. Murray. "It is very abundant," says Jerdon, "in many parts of Southern India, especially along the fine avenues of trees met with in many parts of Mysore and the Carnatic." Concerning its *locale* in the Deccan, Messrs. Davidson and Wender write that they observed it but rarely about Sholapoor. It was commonest at Lanoli and Egutpoora, and its nest was taken on the Satara hills, where it is common in March. It was also seen at Nulwar. The Rev. Dr. Fairbank found it everywhere in the Khandala district, but nowhere abundant; he likewise obtained it in avenues at the north base of the Palanis. The localities recorded by Mr. Ball for it are the Rajmehal hills, Manbhum, Lohardugga, Sirguja, Gangpur and Samuda, Sambalpur and Orissa on the north of the Mahanadi, Nowagarh and Karial, and the Godaveri valley; and elsewhere (Str. Feath. 1874, p. 423) he remarks that most of the specimens he procured in Chota Nagpur belonged to this and not the northern species. Mr. Hume records it from Etawah, Bareilly, Oudh, Futtehgurh, and Meerut, and likewise from various localities in the Central Province, in all of which he states that it breeds.

Habits.—As regards this fine Pigeon's habits in Ceylon I know nothing but that it is said by Layard to be very fond of the fruit of the banyan. Jerdon states that "it comes in large parties, generally about 9 A.M., to certain spots on river-banks to drink, and, after taking a draught of water, occasionally walks a few steps on the damp sand, appearing to pick up small pebbles, pieces of gravel or sand." Their call, he says, "is very similar to that of the Bengal Green Pigeon;" but this he does not describe. Like all its family it is

entirely frugivorous in diet. Captain Butler states that the berries of the *Ficus indica* appear to be its favourite food.

Nidification.—This Green Pigeon breeds throughout continental India from March till June, making, according to Mr. Hume, a typical Dove's nest, and laying two white eggs. Mr. Blewitt, writing concerning nests he found near Hansie, says that they "were placed on various trees, mostly growing on the canal-bank, at heights of from 14 to 18 feet from the ground. They were composed of Shishum, *Zizyphus*, and Keeker twigs, in some cases slenderly and in others somewhat densely put together. One or two were absolutely without lining; but they were mostly very scantily lined with leaves, feathers, or fine straw." This is remarkable for a Pigeon's nest, as they usually have no lining at all, and other observers testify to there being none in the case of this species. The birds sit very close, Messrs. Hume and Marshall both stating, with regard to nests found by them at different times, that they pelted the bird without her flying away. The eggs average in size "1·25 by 0·95 inch."

Genus OSMOTRERON.

Bill more slender than in *Crocopus*. Gape wide. Wings with the quills less pointed, the sinuation present in the 3rd primary; the 2nd quill the longest, and the 1st exceeding the 4th. Tail as in the last genus, of 14 feathers.

Of small size.

OSMOTRERON BICINCTA.

(THE ORANGE-BREASTED GREEN PIGEON.)

Vinago bicincta, Jerdon, Cat. B. S. India, Madr. Journ. 1840, xii. p. 13. no. 289; id. Ill. Ind. Orn. pl. 21 (1847).

Treron bicincta (Jerd.), Blyth, Cat. B. Mus. A. S. B. p. 229 (1849); Kelaart, Prodromus, Cat. p. 130 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 57.

Osmotreron bicincta, Jerdon, B. of Ind. iii. p. 449 (1864); Beavan, Ibis, 1868, p. 371; Holdsw. P. Z. S. 1872, p. 465; Ball, Str. Feath. 1874, p. 423; Legge, Ibis, 1874, p. 25, et 1875, p. 399; Hume, Nests and Eggs, iii. p. 493; Armstrong, Str. Feath. 1876, p. 337; Oates, ibid. 1877, p. 163; Hume & Davison, ibid. 1878, B. of Tenass. p. 411; Ball, ibid. vii. p. 224.

The Parrot-Pigeon, Kelaart; *Orange-breasted Pigeon*, Sportsmen in India; *Green Pigeon*, Europeans in Ceylon. *Chota hurrial*, Hind., also *Koklah*; *Chitta putsa Guwa*, Telugu; *Patcha-prāā*, lit. "Green Pigeon," Tamils in Ceylon; *Groëne Duyven*, Dutch in Ceylon, Layard.

Batta-goya, lit. "Bamboo-Pigeon," Sinhalese.

Adult male and female. Length 10·3 to 10·6 inches; wing 5·5 to 5·8; tail 3·6 to 3·8; tarsus 0·75; middle toe and claw 1·1; bill to gape 0·75 to 0·8.

Females average smaller than males.

Iris carmine outwardly and beautiful cobalt-blue inwardly, divided by a narrow dark ring; eyelid glaucous green; bill with the soft basal half glaucous green, and the terminal part pale blue; legs and feet coral-red or pink-red; claws bluish brown.

Male. Forehead, face, and throat yellowish green, becoming greener on the fore neck and crown, and passing thence into delicate grey-blue on the hind neck and upper part of the interscapulary region; back, scapulars, wing-coverts, and tertials brownish green, passing into greenish brown on the upper tail-coverts; quills deep cinereous blue or ashy black, the greater coverts and lowermost tertials with very deep sharply-defined primrose-yellow margins; primaries with narrow yellowish-white margins; secondaries narrowly edged with the same; tail bluish ashy, with a median dark band, and the terminal portion lighter than the base and showing whitish beneath; a narrow lilac band across the upper part of chest, succeeded by a broader band of orange-sienna; breast yellowish green, passing into yellow on the abdomen and into bluish cinereous on the flanks; centres of tibial plumes ashy green, and the margins yellowish; under tail-coverts cinnamon-red, the basal feathers with white outer edges; under wing concolorous with the flanks.

In some examples the under tail-coverts are much edged and tipped with albescent.

Female. Has the blue of the hind neck of less extent, but darker than the male; the upper surface is more overcast with brownish; the chest wants the lilac and orange bands; under tail-coverts whitish, the *inner webs mostly cinnamon*, and the bases of the feathers dappled with ashy.

Young. Immature birds have the outer circle of the iris reddish yellow. In first plumage they are all clothed in the garb of the female; and males, I believe, assume the light tints on the chest at the first moult, but the under tail-coverts do not become so bright as in the adult.

Obs. This species belongs to a small section of this beautiful genus, the members of which have an orange band on the chest. The other Indian members of the group are *O. vernans*, Linn., *O. phayrei*, Blyth, and *O. fulvicollis*, Wagl.

The Ceylonese representatives of this species seem to constitute almost a diminutive race, measuring constantly less in the wing than continental birds. They correspond, however, too well in plumage (as far as I can judge from the small series with which I have compared them) with Indian birds to warrant my specifically separating them.

Two South-Indian specimens in the national collection measure in the wing 6·2 and 6·3 inches respectively. I have not met with any Northern-Indian examples; but on the other side of the Bay I find, from published data, that still larger measurements prevail. Dr. Armstrong records his specimens from the Irrawaddy delta as having a length of 11·5 to 12·0 inches, and measuring in the wing 6·1 to 6·5; this is again exceeded in Tenasserim by Mr. Hume's measurements, which range as high as 6·75 in the wing. On the other hand, with regard to Ceylonese specimens, I must remark that I measured and preserved far too few examples of this species, inasmuch as they were often transferred to my cook instead of to my taxidermist. As to variation in plumage, the lilac band and orange chest-patch in South-Indian birds are very much the same as in ours; the tint of the latter is perhaps slightly more rufous; in one specimen from South India the throat is yellower than in any of mine. In a female from India I observe that the slaty colour of the hind neck is more extensive, and the upper surface slightly greener than in my specimens, while the lower parts are not so yellow.

O. vernans differs in having the vinous collar in the male extending round the hind neck; the head and throat are slaty and the upper tail-coverts a pronounced rusty colour; under tail-coverts deep cinnamon-red in the male, and creamy white in the female, washed with cinnamon-red as in *O. bicincta*. The female has no ash-colour on the hind neck. Dimensions:—Siam, wing 5·9; Makassar, wing 5·7; Sarawak, wing 5·3. Tenasserim, ♂, wing 5·75 to 6·05 (*Hume*).

O. phayrei I have not seen; but Mr. Hume, in his diagnostical table of these Pigeons (Str. Feath. 1875, p. 162), gives, as distinguishing marks, the grey forehead, crown, and occiput, and the red mantle in the male, and the clear bluish-grey head and green central tail-feathers in the female. Dimensions:—Tenasserim, wing ♂ 6·0 to 6·25, ♀ 6·0 to 6·1.

Distribution.—This handsome Fruit-Pigeon is more or less common all round the coast of Ceylon. In the northern and wilder half of the island and in the south-east, where the sea-board is clothed with jungle, it is found close to the coast and is very abundant there; but in the Western Province and south-west it is principally located in the wooded country at the back of the cocoanut cultivation, and in these parts it extends further inland than in the above-mentioned. It is common in the Rayigam and Kuruwite Korales and in parts of Saffragam; and I have likewise met with it in valleys in the neighbourhood of Morowaka, but it is not so numerous there as lower down near the sea-coast. I have procured it about Kurunegala and in the Seven Korales, but not in such abundance as the next species, which is more forest-loving. At Uswewa, in the interior of the Puttalam district, Mr. Parker says it is found, and likewise about Anaradhapura. Layard states that he did not meet with it in the extreme north, but that he killed a few specimens in the Patchellepally district.

In India the distribution of this Pigeon is somewhat peculiar. It is not found at all in the western parts of Upper India. Mr. Hume has the following outline of its habitat in 'Nests and Eggs,' vol. iii.; he says, "It is entirely unknown in Kandeish, Guzerat, Kattiawar, Sindh, the Punjab, Rajpootana, and the North-west Provinces, and is only known in the sub-Himalayan terais of Behar and Oudh, and the eastern forest-regions of the Central Provinces. It is a purely Indo-Burmese type, not to be found, I think, in India out of the 60 inches rainfall regions, and, excluding Assam, Cachar, &c., is not, I believe, to be found over more than one third of India proper."

I do not find it recorded by many observers in South India, but I have seen specimens from the Carnatic. In the hills, where it is not to be expected that it would be found, it is seemingly replaced by *O. malabarica*, which is noticed as being found in the Travancore hills, in the Palanis, and in the Khandala ranges. Mr. Ball, on the testimony of Capt. Beavan, records it from Manbhum; the latter gentleman writes, in 'The Ibis,' 1868, that he found it in some abundance in the hilly forest-covered parts of that district, especially near Ambekanuggur and among the Jubee hills, where he noticed a flock of five or six. Mr. Cripps does not record it from Furreedpore, nor does Mr. Inglis from Cachar; but in the latter district it is said by Jerdon and Mr. Hume to be found. It inhabits portions of Pegu, and in the Irrawaddy delta is said to be abundant by Dr. Armstrong, more particularly in the evergreen forests between Elephant Point and China Ba-keer. He also says that it occurs in tolerable abundance in thin tree-jungle and hedges on the borders of forest land. In Tenasserim it is common throughout the Provinces, except in the higher hills; and lower down the peninsula I suspect it is entirely replaced by *O. vernans*, which is confined to the southernmost part of Tenasserim.

Habits.—The Orange-breasted Fruit-Pigeon affects low jungle, the outskirts of forest, detached rows of trees in open country, and sundry other localities where any of its favourite fruits abound. It associates in

small parties, as a rule, but collects in large flocks on trees which are in heavy fruit. Its favourite food consists of the berries of the Bo, Banyan, Palu, and Poppalille trees; on these it feeds with such avidity that it will return to the trees very shortly after being shot at. Its flight is swift; and when returning from its feeding-grounds in a continuous stream at evening-time it affords good shooting, as it crosses the roads in the northern and eastern jungles. This and the next species are much shot by the natives who possess guns; they take up their position beneath some fruit-bearing monarch of the forest, and shoot the Pigeons as they fly in to feed in the mornings. It has a regular time, like other Fruit-Pigeons and Doves, for drinking, which is about seven in the morning and four in the afternoon. The flesh of this species is succulent and well-flavoured; but it is not so delicate as that of the next bird. Its note is a hoarse croak, repeated at intervals, but it is usually a silent bird.

In the south of Ceylon I found that they fed much on wild dates; an example I shot near Galle had its crop almost extended to bursting with this fruit. They are fond of frequenting hedges of fruit-bearing trees in open land; and I have often seen them frequenting rows of the common "Caduru"-tree, although there can be nothing, of course, in the large nauseous fruit of that tree to tempt them.

Layard, who was under the impression that it only fed on berries from the highest trees (it is frequently found feeding on quite low trees), remarks as follows concerning it:—"Vast numbers are killed in the southern and western provinces by noticing what trees are in fruit, and watching at their foot for the birds, which are continually going and coming. It, however, feeds so silently and moves so seldom, that it requires much skill to detect a single bird out of a flock of fifty or sixty; and on the least alarm, which is communicated from one to another by a plaintive whistle*, they all dart off the tree as by magic; frequently, on firing at a bird which exposed itself, I have brought down seven or eight others which I could not see."

Captain Beavan found it feeding generally in Manbhum on the pulpy orange-coloured fruit of the *Strychnos nux-vomica*, which grows abundantly there and affords sustenance to many wild Pigeons.

Nidification.—I believe this Pigeon breeds for the most part in May and June, but that it also nests as late as August. Layard writes that "it forms a nest in the month of May, of sticks, with a very slight lining of roots, &c., in the fork of a tree, and deposits two shining white eggs: axis 14 lines (1·18); diameter 10 lines (0·85)." It would appear that the nest is very difficult to find; and I never succeeded in getting much reliable information from the natives concerning it. When interrogated on the subject they generally replied that its nest was far away in the "mukalaney" (forest); and in many parts they have an idea that no one has ever seen the nest of a "Batta-goya."

In the summer of 1871 some eggs were kindly sent me by the Mudliyar Disanayke of Baddegama, which were taken in bamboo-jungle, and said to belong to this Pigeon; they must have been those of this or the next species, if the locality was rightly given me, for they were not the Ground-Dove's eggs. They were pure white and oval in shape, and slightly larger than those of the Spotted Dove. I regret to say that they got lost with a number of other eggs before I had taken any measurements. In August 1876, while forcing my way through some dense bamboo-cheena in the Pasdun Korale, I flushed a female from a clump of bamboos; she flew into an adjoining thicket and there remained, from which I infer that she was sitting; it was, however, raining so hard that I could not find the nest, and after a short search I gave up looking for it.

Few have been successful in India in finding its nest. Blyth records one which was built halfway up a small mahogany-tree in the Calcutta gardens. Hodgson states that it breeds in the Terai in April and May and in the low valleys at the base of the Nepal hills, making a loose stick nest on branches of trees at no great elevation from the ground, and laying two eggs. Mr. Irwin, as recorded by Mr. Hume, found its nest in Hill Tipperah; it was a slight structure of thin twigs, loosely put together, and laid towards the end of a branch of a small tree. It contained two eggs.

Mr. Oates, again, took the nest in a thick bush about 7 feet from the ground; it was merely a few sticks laid together like a Dove's. The eggs were "white, with a little gloss, 1·06 and 1·09 by 0·87 respectively." The eggs sent by Mr. Irwin measured 1·1 and 1·02 in length by 0·9 and 0·85 in breadth.

* This would appear to refer to the other species, *O. pompadora.*

OSMOTRERON POMPADORA*.

(THE POMPADOUR GREEN PIGEON.)

Colomba pompadora, Gm. ed. Syst. Nat. i. p. 775. no. 9, "Zeyloniæ" (1788); Walden, Trans. Zool. Soc. 1875, ix. p. 212.

Treron malabarica (Jerd.), Blyth, Cat. B. Mus. A. S. B. p. 229 (1849, in part); Kelaart, Prodromus, Cat. p. 130 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 58.

Treron flavogularis, Blyth, J. A. S. B. 1857, xxvi. p. 225; Wall. Ibis, 1865, p. 375 (in part).

Treron pompadora (Gmel.), Wall. *t. c.* p. 375 (in part); Schlegel, Mus. P.-B. 1873, p. 52.

Osmotreron flavogularis (Bl.), Jerdon, B. of Ind. iii. p. 452 (1864); Legge, Ibis, 1874, p. 25.

Osmotreron pompadoura (Gmel.), Jerdon, *t. c.* p. 452 (in part); Holdsw. P. Z. S. 1872, p. 465; Hume, Str. Feath. 1879 (List of Ind. B.), p. 109.

Pompadour Pigeon, Brown, Illustr. pl. 19 (male), pl. 20 (female); *Green Pigeon*, Europeans; *The Maroon-backed Pigeon. Patcha-prāā*, also *Alam-prāā* (Trincomalie district), Ceylonese Tamils.

Batta-goya, Sinhalese.

Adult male and female. Length 10·3 to 10·6 inches; wing 5·5 to 5·7; tail 3·5 to 3·8; tarsus 0·8; middle toe and claw 1·0 to 1·1; bill to gape 0·9 to 0·95.

Iris carmine-red, with a cobalt inner circle; eyelid glaucous green; bill glaucous green, paling to bluish on the apical portion; legs and feet purple-red.

Male. Forehead, face, and loral region greenish yellow, blending into the purer yellow of the throat and the ashy blue of the crown and nape, which latter blends into the ashy green of the hind neck and its sides; interscapular region, scapulars, and all but the two greater rows of coverts maroon; lower back, rump, and central tail-feathers dull green; remaining rectrices green at the base (except on the two outer ones), passing into black across the centre, and with deep bluish-ashy tips, showing whitish beneath; quills ashy black, the outer and greater coverts, secondaries, and tertials sharply edged with rich primrose-yellow, very broadly on the tertials and inner coverts, and decreasing towards the anterior portion of the wing; beneath yellowish green, blending into bluish ashy on the flanks and flavescent on the abdomen; tibial plumes dark greenish ashy, broadly edged with yellowish white; under tail-coverts white, with a faint rufescent yellowish tinge, and with the bases of the feathers speckled with ashy; under wing-coverts bluish ashy.

Female. Forehead and face not so yellow, but the throat the same as in the male; upper surface brownish green, without the maroon mantle; the yellow wing-edgings not so bright, and the under tail-coverts with more ash-colour at the base.

Young. Iris with the outer portion yellow, or reddish yellow, instead of carmine.

Males of the year are clothed in the dress of the female, and put on the maroon mantle by an alteration in the colour of the feather, acquiring the bluish cap or crown at the same time.

Obs. Gmelin's species, which was afterwards named *O. flavogularis* by Blyth, is noted by Mr. Hume as occurring in South India; but Lord Walden, in his list of the species of *Osmotreron*, in the 'Transactions of the Zoological Society,' 1875, enters it as found in Ceylon only. The published data as to its occurrence in South India are so scanty that I am myself unable to form an opinion as to whether it is or is not peculiar to Ceylon. Jerdon,

* I have retained the original spelling of Gmelin; the name, of course, has reference to "*Pompadour;*" but it seems to me very unadvisable to alter the original orthography of a *specific* name, except when an error of gender has been committed.

who states that he had noticed it as a variety of *malabarica* from South India, before it was discriminated as *O. flavogularis* by Blyth, was not aware what localities it frequented, although, many years previous to his publication of the 'Birds of India,' he mentions the shooting of a specimen which appears to have been the same. I conclude, however, that Mr. Hume has specimens from the south of the peninsula, and I will only add that Blyth discriminated his *flavogularis* from Ceylon specimens; and therefore it is plain that his species is the same as Gmelin's.

O. pompadora differs from *O. malabarica* chiefly in the coloration of the under tail-coverts. In the male of the latter the longer feathers are cinnamon-colour, and the shorter lateral ones whitish with slaty green bases; the forehead is ashy white, darkening gradually to slaty on the crown and nape; the mantle is maroon, as in our bird, but the rump and upper tail-coverts are yellower; the throat is likewise yellow; wing of a South-Indian specimen 5·7.

O. griseicauda, Wallace, from the Sula Islands and Celebes, belongs to the same section as *O. malabarica*. It has the face, forehead, and crown fine leaden grey; the mantle, scapulars, and lesser wing-coverts maroon, the colour not extending so much to the point of the wing as in *O. pompadora*: ♂, Sula Islands, wing, 5·75; Java (*O. pulverulenta*, Wall.), wing 5·6.

O. chloroptera, Blyth, from the Andamans, has the under tail-coverts green, with cream-coloured tips in both sexes; it is more closely allied to our bird than the Celebean species, differing chiefly in having the forehead bluish white; the crown is bluish, as in *O. pompadora*, the wing-coverts and tertials are more broadly margined with yellow; rump and upper tail-coverts greenish yellow; throat greenish.

Distribution.—This stout handsome little Pigeon is very abundant throughout all the inland forests and well-wooded districts of Ceylon. On the north-east coast, however, where the forest and wild jungle grow down to the water's edge almost, I have met with it in numbers close to the sea; but, as a rule, its place is taken on the sea-board by the last-mentioned species. In the forests of the Vanni, and, in fact, throughout the northern half of the island, in the Eastern Province, and in the jungle-country south of Haputale, it is abundant. In the latter region I did not notice it near the sea, except where the rivers were lined with forest containing fruit-bearing trees; but the Orange-breasted Pigeon was to be seen in the scrubs near the sea wherever they were interspersed with Palu-trees. In the south-west this latter species is, as I have already remarked, common in wooded country not far from the coast; but the present is met with first in noticeable numbers some distance up the rivers, and becomes numerous in the Oodogamma district, inhabiting thence the Hinedun pattu up to the Singha-Rajah forest on the borders of the Kukul Korale, where I have seen it at an elevation of 2000 feet. Further north, in the low-lying wooded and semi-cultivated portion of the Kukul Korale and in the forest-country of the Pasdun Korale, it is very numerous, extending throughout Saffragam: round the base of the Peak it swarms; in fact, I do not think I found it anywhere on the western side of the island more abundant than in Mr. Chas. de Zoysa's timber-forests at Kuruwite in the month of August. Layard first procured it in the Matale district on the Balacadua Pass: thither it extends up from the low country between Nalanda and Matale, where it is very numerous. On the western base of the West Matale ranges it is equally plentiful, and in the Seven Korales and Kurunegala district is more numerous than the last species. Mr. Parker notes it from Uswewa and Anaradhapura.

Its range as a South-Indian species appears to be very limited. Jerdon, who writes of it under Blyth's subsequent title of *flavogularis*, and mentions that it was discriminated from Ceylon specimens by that naturalist, has the following statement (to which I have alluded above) concerning it:—"I had long previously noticed it from the south of India as a variety of *malabarica*, but I am not aware what particular localities it affects." Writing many years previously of *O. malabarica*, he speaks of an example which appears to me to have belonged to the present species. "One specimen," he remarks, "that I shot in Malabar differs from the others in having the face, forehead, and chin yellow, the under tail-coverts mottled with green and white, and in the bluish tips of the lateral feathers being broader" than in *malabarica*.

The Pompadour Pigeon was first made known from Ceylon, whence specimens were sent by Governor Loten to Brown.

Habits.—This Pigeon is an inhabitant of woods, forests, and openly-timbered country; it collects together in the fine Banyan-, Bo-, and Palu-trees which are scattered through the low jungles of the eastern and northern districts, and also in the magnificent outspreading Mee-trees which line the borders of the jungle tanks, and in such resorts feeds in flocks on the luscious berries which these large trees provide. Its

flesh is at all times delicious; but when killed during the fruiting-time of the banyan and iron-wood, there is nothing which surpasses this Pigeon in flavour in the island. It is a shy bird and difficult to kill, except when feeding; it may then easily be shot out of large forest trees, provided the sportsman be concealed, as it feeds so greedily that many do not take flight on the discharge of a gun. They collect in troops of a dozen or more early in the morning or after feeding, and sit motionless on the tops of trees; on being alarmed, one or two dart off, and are followed by their companions, one after another, till the whole have taken flight. They are very strong on the wing, and fly with a steady straight course. Their note is a melodious, soft, modulated whistle, which can be precisely imitated, and by doing which many are enticed, by "Eurasians" in the north of Ceylon, into uttering it, and are thus more easily descried in the green foliage and then shot. There is something peculiarly charming in their human-like notes when heard in the tops of lofty trees overshadowing the mighty bunds by which the ancient kings of Ceylon dammed up valleys and skilfully formed vast reservoirs for the support of their subjects in the wild forests of the Vanni. In the Wellaway Korale, where this Pigeon is abundant, I have seen, as in the case of the two preceding species, large flocks in scattered company returning in the evening from their feeding-grounds or from the widely-dispersed water-holes of that district; and by remaining in wait for them in the same position, I have had excellent shooting. Both this and the Orange-breasted Pigeon, however, are very strong birds, and take more hitting to bring them down, especially when perched, than almost any bird of the same size in Ceylon.

Doubt has been expressed whether Brown's figure of Governor Loten's specimen from Ceylon really represents this species or not, and it has been thought that there may be some other Pigeon on the island to which the title of *pompadora* was applied; but Brown's account of the habits of Governor Loten's Pigeon can, inasmuch as it refers to an abundant species, only relate to the Pompadour Pigeon; it is as follows:—"These birds are never seen on the ground, but always perched on high trees, generally the *Warringen grothebia*, on the berries of which they delight to feed. They are good food, and often shot by the Europeans. The natives catch them with bird-lime. In this manner, says Mr. Loten, who was Governor of Ceylon, I once found some hundreds, if not more, by break of day, sticking to the boughs of the great Warringen tree, and sent a native servant to take them off."

In those days the natives of Ceylon must have been more expert bird-catchers than they are at the present time.

Nidification.—I was unable to obtain any information from the natives of the island as to the breeding of this species. It probably nests high up in umbrageous trees and at the extremities of boughs, easily escaping the unobservant eye of the Singhalese villager.

Order GALLINÆ.

Bill short, high at the base, more or less curved, the tip vaulted and bent down; nostrils pierced in a capacious membrane, covering the base of the bill in some. Wings short, ample, and generally rounded. Tail very variable, of from 12 to 18 feathers. Legs and feet stout; tibia feathered to the knee (except in *Pedionomus*). Tarsus frequently spurred. Toes three in front and one behind, which is usually elevated above the plane of the anterior toes; hind toe wanting in some.

Sternum with two very deep emarginations on each side. Entirely ground-feeding and with the habit of scratching for their food.

Fam. PHASIANIDÆ.

Bill strong, high at the base, vaulted at the tip, which overhangs the lower mandible; nostrils apart; face more or less nude. Wings short and rounded. Tail usually lengthened, of from 12 to 18 feathers. Tarsus moderately long, stout, covered in front with large polygonal scales; usually spurred. Anterior toes united at the base by a small membrane.

Mostly of large size; plumage of the sexes differing.

Genus PAVO.

"Bill lengthened, slender, the nareal portion large; nostrils linear; head ornamented with an erect crest of feathers of a peculiar structure, orbitar region naked. Tail moderately long, of 18 feathers. Feathers of the back and upper tail-coverts of great length, surpassing the tail, and beautifully ocellated. Tarsi rather long and spurred." (*Jerdon*, B. of Ind. iii. p. 506.)

PAVO CRISTATUS.

(THE PEACOCK.)

Pavo cristatus, Linn. Syst. Nat. i. p. 267 (1766); Blyth, Cat. B. Mus. A. S. B. p. 239 (1849); Kelaart, Prodromus, Cat. p. 131 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 62; Irby, Ibis, 1861, p. 234; Sclater, P. Z. S. 1863, p. 123; Jerdon, B. of Ind. iii. p. 506 (1864); Beavan, Ibis, 1868, p. 379; Holdsw. P. Z. S. 1872, p. 467; Elliot, Monog. Phasian. i. pl. 3 (1872); Adam, Str. Feath. 1873, p. 392; Ball, ibid. 1874, p. 426; Hume, Nests and Eggs, p. 510 (1875); Butler & Hume, Str. Feath. 1876, p. 5; Fairbank, *t. c.* p. 202, et ibid. 1877, p. 409; Ball, ibid. 1878, vii. p. 225.

Pavo assamensis, M'Clelland, Ind. Rev. 1838, p. 513.

Le Paon (male), *La Paonne* (fem.), Buff. Pl. Enl. 433, 434; *Peafowl. Mor*, *Mohr*, also *Manjur*, Hind.; *Nimili*, Telugu; *Myl*, Tam.; *Mabja*, Bhotias; *Mong-yung*, Lepchas; *Mayal*, Dutch in Ceylon; *Pavaan*, Portuguese in Ceylon; *Miyil*, Tamils.

Monara, Sinhalese (Layard).

Adult male. Length to end of tail 45·0 to 50·0 inches; wing 18·0 to 22·0; tail about 24·0 inches, "train" (in old birds) 4 to 5 feet; tarsus 5·5 to 6·0 inches; middle toe 2·9; hind claw 0·5; bill to gape 2·0.

The "train" in a fine specimen in the national collection, British gallery, measures about 4 feet 9 inches.

Iris dark brown; bill pale brown, darker at the tip; orbital skin greyish; legs fleshy brown, toes darker.

Neck and chest metallic prussian or lazuline blue, the centres of the feathers pervaded with a greenish tinge; feathers of the head, upper part of throat, and the sides of the head green, tipped with blue; the ear-coverts, lores, and a streak over the eye black; back "beetle"-green, with scaly or clearly-defined black margins to the feathers, which are circular at the tips; lesser wing-coverts, scapulars, tertials, and the innermost greater coverts buff, each feather with a wavy bar of black; the markings of the scapulars and tertials of a broader type than the others, and glossed with green; secondaries blue-black; greater coverts brilliant purple, the inner webs illumined with green; primaries and primary-coverts cinnamon-red, paler on the outer webs; the blue of the chest changes into deep green on the breast, the centres of the feathers darkest; vent and under tail-coverts brown; shorter upper tail-coverts bronze-green, the tips enclosing a large circular brown patch, in the centre of which is a blue-green circle containing a blackish-blue "eye" or disk; longer upper tail-coverts or "train" the same as the shorter, the ocelli are larger, and the brown ground-colour surrounded by a golden-green and violet circle, the whole feather being illumined with a brilliant metallic gloss; the decomposed portion of the webs of the longer feathers is very bronze; tail brown; crest-feathers blue-green at the tips.

Abnormal forms of crest are sometimes seen. Mr. Bligh writes me of a female, recently shot, which had a double crest—that is, the shaft was produced above the tip, and surmounted again by a second expansion.

Female (India: B. Museum). Crown and in front of the eye chestnut; tips of the crest-feathers brown; throat and sides of the neck adjacent to it white; ear-coverts tipped brownish; beneath the white gorget the neck is ferruginous chestnut, changing to green, the feathers being tipped with whitish, which increases on the chest; back, wings, and upper tail-coverts brown; the latter lengthened, reaching to within about 3 inches of the tail, and mottled with whitish; greater wing-coverts darker brown than the back and mottled with whitish; quills brown; tail blackish brown; breast and abdomen white.

Young (nestling, partly feathered: B. Museum). Head, back, and lesser wing-coverts rusty brown; face, lores, and under surface buff-white, extending above the eye; hind neck fulvous-brown; median wing-coverts whity brown, the greater series tipped with white, with a subterminal blackish bar; primaries cinnamon-colour; secondaries brownish cinnamon, tipped and barred at the ends like the coverts; tail brownish, tipped with white.

Immature birds in the first year resemble females.

Obs. Ceylonese examples are quite as fine as Indian. The length of the train varies, of course, with age, and birds of similar age must therefore be compared with one another.

The Burmese Peacock (*P. muticus*), the representative of the Indian species beyond the Bay of Bengal, differs from this latter in having a different crest and a handsomely-coloured facial skin of blue and yellow. The crest reaches a length of nearly 5 inches at times; the feathers are webbed. Crown emerald-green. The feathers of the neck and chest are blue at the bases, with golden-green edges, those of the back metallic green, illumined with bronze and edged with black; the primaries are paler than in the common species, the secondaries are brownish green, and the ocelli, though of similar colour, are smaller, and the purple-blue centres are more indented or divided at the upperside by the green.

Distribution.—The Peacock is essentially a bird of the dry districts of Ceylon. It is comparatively unknown in the humid district south of the Maha-oya (W. Province), and in travelling eastward from Galle is first met with shortly after leaving Tangalla. It is tolerably plentiful in the eastern portion of the Girawa Pattu, and its numbers increase towards the east. In the Hambantota, Kirinde, and Yāla districts it is as abundant as anywhere in the island, but it does not extend (at any rate in large numbers) further inland than the southern portion of the Wellaway Korale. It is tolerably numerous throughout the maritime parts of the Park country, as far north as the Batticaloa Lake, and is likewise plentiful in the interior of that district. Northward of this again it is numerous beyond Vendeloos Bay, and inland through the delta of the Mahawelliganga to the Vellai-Plains district. Round Tamblegam Bay, and thence towards Kanthelai tank, it is common; and near the Bay I have seen as many as twenty in a flock. Immediately to the north of Trincomalie it is not common, probably owing to the manner in which it has been shot away by the natives for the market in the town. But

beyond Tirai, as far as Mullaittivu, and northward of that place to the Jaffna Lake, is the home of the Peacock in that part of Ceylon; and from the sea-board it seems to extend inwards in many places, as it is found in the forest bordering some of the tanks in the heart of the Vanni. On the opposite coast, from Jaffna down to Manaar, and as far south as the Puttalam district, it is likewise tolerably plentiful, but confined there to certain localities. Mr. Parker records it from Uswewa and from the Anaradhapura district; but in such central localities it is not nearly so common as on the sea-board. It is found, I believe, on the banks of the Mahawelliganga up to its outflow from the eastern ranges, but I do not know of its ever having been obtained anywhere in the hills themselves.

Jerdon tells us that the Peafowl inhabits the whole of India proper; but it appears to be local in its distribution, keeping to forest and well-wooded districts. According to him it ascends the Nilghiri and other South-Indian ranges to an altitude of 6000 feet, but not the Himalayas above 2000 feet. It is somewhat noteworthy that it affects such elevated districts, when it is strictly a low-country bird in Ceylon; in fact it seems to prefer hills to flat country in many parts of India, probably, however, because the latter is, to a great extent, either under cultivation or too bare to harbour it. Mr. Ball found it abundant in the hilly parts of Chota Nagpur, as also in the Orissa tributary state of Mohurbanj, to the south of the Province, where it is revered and consequently strictly preserved from molestation. The same writer, in his recent paper (Str. Feath. 1878, vol. vii.), records it from the Rajmehal hills, Sambalpur and Orissa, north of the Mahanadi, and likewise from Nowagarh, Karial, and Jaipur. Mr. Hume notes it from Raipur in the Central Provinces. In the north-west of the empire it is found everywhere in Rajputana and Guzerat where there is cover, for it is held sacred and protected by the natives. Captain Butler says that it abounds in the jungles at the base of Mt. Aboo, and remarks that in the neighbourhood of villages it is quite domestic in its habits. It does not extend into Sindh.

In the Deccan Messrs. Davidson and Wender say that it is common in suitable localities; and in the Khandala district it is found, according to the Rev. Dr. Fairbank, in wooded hills and ravines, but is not abundant; he likewise records it from the northern base of the Palani hills, and Mr. Elwes notes it from the Cardamum hills in Travancore. In the central portions of Upper India, Messrs. Anderson, Marshall, and others all bear testimony to its distribution and abundance in some parts of that region.

It has been sought to introduce the Peacock into some places with a view to turning it out as a wild bird; and as such it appears to have existed in St. Helena; but Mr. Melliss writes (Ibis, 1870, p. 103) that "the farmers found it so destructive to their gardens, that they took every opportunity of killing it; consequently, about half a century ago, they were exterminated."

The *habits* of the Peacock are perhaps too well known to necessitate my writing much on the subject; but as many of my readers have had no acquaintance with this beautiful bird in its wild state, it will not be out of place for me to say something on that head. As an inhabitant of its native wilds it is an extremely wary bird, although, as we have seen, when it is strictly protected and induced thereby to frequent the neighbourhood of villages, it becomes the reverse of shy. Mr. Adam bears testimony to its instinct in this matter when he writes concerning it in Rajputana that the parent birds keep their young after being hatched well out of sight, "but as they grow up, *no danger being anticipated,* the young are brought on to the roads and about the temples without fear." In Ceylon it inhabits, by choice, forest-groves (consisting of large trees, combined with underwood) in the vicinity of secluded open places, in which it loves to feed in the early morning, rejoicing in the complete retirement afforded it by these wild haunts; it also affects the dense low jungle clothing the shores of the Eastern Province, coming out to feed on the grassy borders of rivers and salt lakes. In these localities it is most difficult to shoot, for it threads its way through the scrub with marvellous rapidity, decamping at the least sound of a footstep on the dry grass. On taking alarm, it will stealthily enter the jungle; and if a rush be made to the spot in hopes of getting a running shot, the sportsman will be surprised to find that his "game" has entirely disappeared, sounds of its retiring footsteps, far beyond the range of his vision into the thicket in front of him, being the only sign of the fine bird which he has just seen, and will not see again that morning! I have watched one from a distance, threading its way through a number of isolated clumps of scrub on the borders of a salt lagoon in the Kirinde district, and been surprised to notice how quickly it got over the ground, its long beautiful train whisking from side to side as it avoided the stumps and

branches in its way. After feeding in forest-districts it is its habit to mount up to the lower limbs of large trees and dry the morning dew from its plumage; and it is a fine sight to see a number of these splendid birds in this elevated position at the edge of a grove. They will remain preening themselves until approached within a few hundred yards, and then disappear at once into the scrub beneath them. Towards evening, I have noticed that they again take to trees, and rest on large limbs, where they can have an outlook on the surrounding thickets and easily apprize themselves of any danger. Emerson Tennent, in writing of the forest solitudes of the Park country, speaks thus of the Peafowl which frequent them :—"As we emerge from the dark shade and approach the park-like openings on the verge of the low country, quantities of Peafowl are to be found, either feeding on the seeds among the long grass, or sunning themselves on the branches of the surrounding trees. Nothing to be met with in English demesnes can give an adequate idea of the size and magnificence of this matchless bird when seen in his native solitudes. Here he generally selects some projecting branch from which his plumage may hang free of the foliage; and if there be a dead and leafless bough, he is certain to choose it for his resting-place, whence he droops his wings and suspends his gorgeous train, or spreads it in the morning sun to drive off the damps and dews of the night."

As Jerdon truly remarks, few sportsmen resist a shot at a fine Peacock whirring past them, although it is not a favourite game, old birds being tough and unfit to eat. The young Peahen, however, when cooked in an orthodox fashion, is excellent eating; and these birds, as the native Shikarees knew well, were not by any means despised by the garrison in the Fort of Trincomalie, a locality not famed for the quality or quantity of the butcher's meat.

The *Pitta*, more than any bird in Ceylon, has been the subject of legends with the inhabitants of the country; and I have already, in previous articles, referred to some of these. There is one mentioned by Emerson Tennent, connected with the Peacock, to the effect that this bird stole the plumage of the *Pitta* or *Avitchia*, whose singular cry the Singhalese liken to the word *mat-ki-ang*, which means, "I will complain;" and this, "they believe, is addressed by the bird to the rising sun, imploring redress for its wrongs"!

Mr. Elliot, in his magnificent 'Monograph of the Phasianidæ,' gives the result of his observations of the Peacock in the Terai in the following interesting paragraph :—

"In the months of December and January, the temperature in the forests of Central India, especially in the valleys, is very low, and the cold (from sudden evaporation) intense at sunrise. The Peafowl in the forest may be observed at such times still roosting, long after the sun has risen above the horizon. As the mist rises off the valleys, and, gathering into little clouds, goes rolling up the hill-sides, till lost in the ethereal blue, the Peafowl descend from their perch on some high seemul or saul tree, and, threading their way in silence through the underwood, emerge into the fields, and make sad havoc with the chunna, oorid (both vetches), wheat, or rice. When sated, they retire into the neighbouring thin jungles, and there preen themselves, and dry their bedewed plumage in the sun. The cock stands on a mound or fallen trunk, and sends forth his well-known cry, *pehaun-pehaun*, which is soon answered from other parts of the forest; the hens ramble about or lie down dusting their plumage; and so they pass the early hours while the air is still cool, and hundreds of little birds are flitting and chirruping about the scarlet blossoms of the polâs or the seemul. As the sun rises and the dewy sparkle on the foliage dries up, the air becomes hot and still, the feathered songsters vanish into shady nooks, and the Peafowl depart into the coolest depths of the forest, to some little sandy stream canopied by verdant boughs, or to thick beds of reeds and grass, or dense thorny brakes overshadowed by mossy rocks, where, though the sun blaze over the open country, the green shades are cool, and the silence of repose unbroken, though the shrill cry of the Cicada may be heard ringing faintly through the wood. There are spots in these saul-forests which, for luxurious coolness during the sultriest weather, rival the most elaborately devised recesses of the Alhambra, or the tinkling fountains of Isfahan; and the wilder denizens of the woods show no small discernment in selecting them. . . . . . In such lovely retreats one might cheat the hot hours of noon, and rob them of their discomfort; but, alas! these are the spots where lurks malaria, and, moreover, where one may be very apt to intrude on the privacy of some misanthropic tiger!" Other writers, likewise, tell us that the natives believe tigers always frequent forest where Peacocks abound.

In a state of nature the Peacock is chiefly granivorous, feeding on seeds, grain, and buds, but it likewise consumes insects; in a domestic state it is, as we all know, omnivorous, neither fish, flesh, nor fowl, nor any thing that it can get hold of, coming amiss to it.

A brother officer, who is well acquainted with the Peacock in a state of nature, informs me that the young birds in Bengal resort much to the fields of Jowaree, and afford excellent shooting.

Notwithstanding the showy manners of a fine Peacock as seen in an English demesne, those who have not seen him in a state of nature during the courting-season can form no idea of his pomp and pride when strutting about with tail and train erect for the gratification of his partners; and when half a dozen full-plumaged birds are seen occupying a small opening in the forest, holding one of these displays, each vieing with the other in his efforts to exhibit his gorgeous attire, the sight is one not easily to be forgotton. I once came suddenly upon such a *Pavonian* arena in some jungle near Tamblegam; and the sudden change in the performance, as the affrighted actors fled in all directions, was very amusing.

Numbers of Peacocks are caught in India by means of snares, which consist merely of hair nooses; they are then sold alive for the purpose of being domesticated. That it has from the earliest times been regarded with great admiration by eastern nations is unquestionable, and the date of its exportation from India into other countries must be very remote. We have inspired authority as to its being brought to Palestine, and having contributed towards the wealth of Solomon's possessions; and from that country it found its way, most likely, to Greece and Rome. Aristotle wrote concerning it, and (among other facts of its natural history) stated that it laid twelve eggs. After devoting two pages to it, he concludes with the following passage, which, though true in essence, is decidedly uncomplimentary:—"They are pestilent things in gardens, doing a world of mischief; they also throw down the tiles and pluck off the thatch of houses; the Peacock, saith Aldrovandus, though he be a most beautiful bird to behold, yet that pleasure of the eyes is compensated with many ungrateful strokes upon the ears, which are often afflicted with the odious noise of his horrid cry, whence, by the common people in Italy, it is said to have the feathers of an angel, but the voice of a devil and the entrails of a thief. It is said (and I can easily believe it) to produce its life to an hundred years."

Nidification.—In the Hambantota district the Peafowl breeds from January till April; it lays its eggs in a depression in the ground, lined with dry grass and leaves. Two eggs which I have from this part of the island measure 2·66 and 2·74 inches in length, by 2·1 and 2·28 in breadth respectively. They are stumpy at both ends, and, as can be seen by the measurements, very round; the ground-colour is greyish buff; one of them has faint reddish-grey blotches in a zone near the smaller end.

In India it breeds from July until October, and is variously described as nesting in thick grass, dense bushes, among thick underwood, on sloping banks, or even on the bare ground; and the nest is said to be lined "with a few leaves and twigs or a little grass." Mr. Hume is of opinion that six or seven is the usual complement of eggs; but Miss Cockburn found as many as fifteen in one nest; but it may be that these were not all laid by one bird. The eggs are described as typically rasorial, the shells closely pitted throughout with minute pores, more deeply indented in some than in others; some are thickly freckled with pale reddish brown. The average size of forty eggs measured by Mr. Hume is 2·74 by 2·05 inches.

Genus GALLUS.

Bill rather short, high at the base, the tip much curved and vaulted, and overlapping the under mandible; base of the upper mandible covered with a cere, in which the nostrils are pierced. Wings short, rounded, ample; the secondaries equal to the primaries; the 1st quill much shorter than the longest, which is the 5th. Tail of 14 feathers, divaricate; central feathers much elongated and drooping, curved outwards at the tips. Tarsus stout, covered in front with pentagonal scales and with a stout spur on its inner side; outer toe longer than the inner.

Head furnished with a comb or crest of skin. Face nude. Throat wattled. Neck-feathers hackled.

GALLUS LAFAYETTII.

(THE CEYLON JUNGLE-FOWL.)

(Peculiar to Ceylon.)

Gallus lafayettii, Lesson, Traité, p. 491 (1831); Kelaart, Prodromus, Cat. p. 131 (1852); Emerson Tennent, Nat. Hist. Ceylon, p. 259 (1868); Elliot, Monog. Phasianidæ, ii. pl. 33 (1873); Hume, Nests and Eggs, iii. p. 530 (1875).

Gallus stanleyi, J. E. Gray, Ill. Ind. Zool. iii. pl. 43 (1833); Blyth, Cat. B. Mus. A. S. B. p. 243 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 62; Sclater, P. Z. S. 1863, p. 122; Jerdon, B. of Ind. iii. p. 540 (1864); Blyth, Ibis, 1867, p. 307; Gray, Hand-l. B. ii. p. 261 (1870); Holdsw. P. Z. S. 1872, p. 468; Legge, Ibis, 1875, p. 400.

Gallus lineatus, Blyth, J. A. S. B. 1847, xvi. p. 387.

Lafayette's Jungle-fowl, Elliot; *Jungle-fowl* of Europeans. *Wild Hoën*, Dutch; *Galienha di Matoe*, Portuguese in Ceylon (Layard); *Kāda-koli*, Ceylonese Tamils.

Weli-kukula (male), *Weli-kikili* (female), Sinhalese.

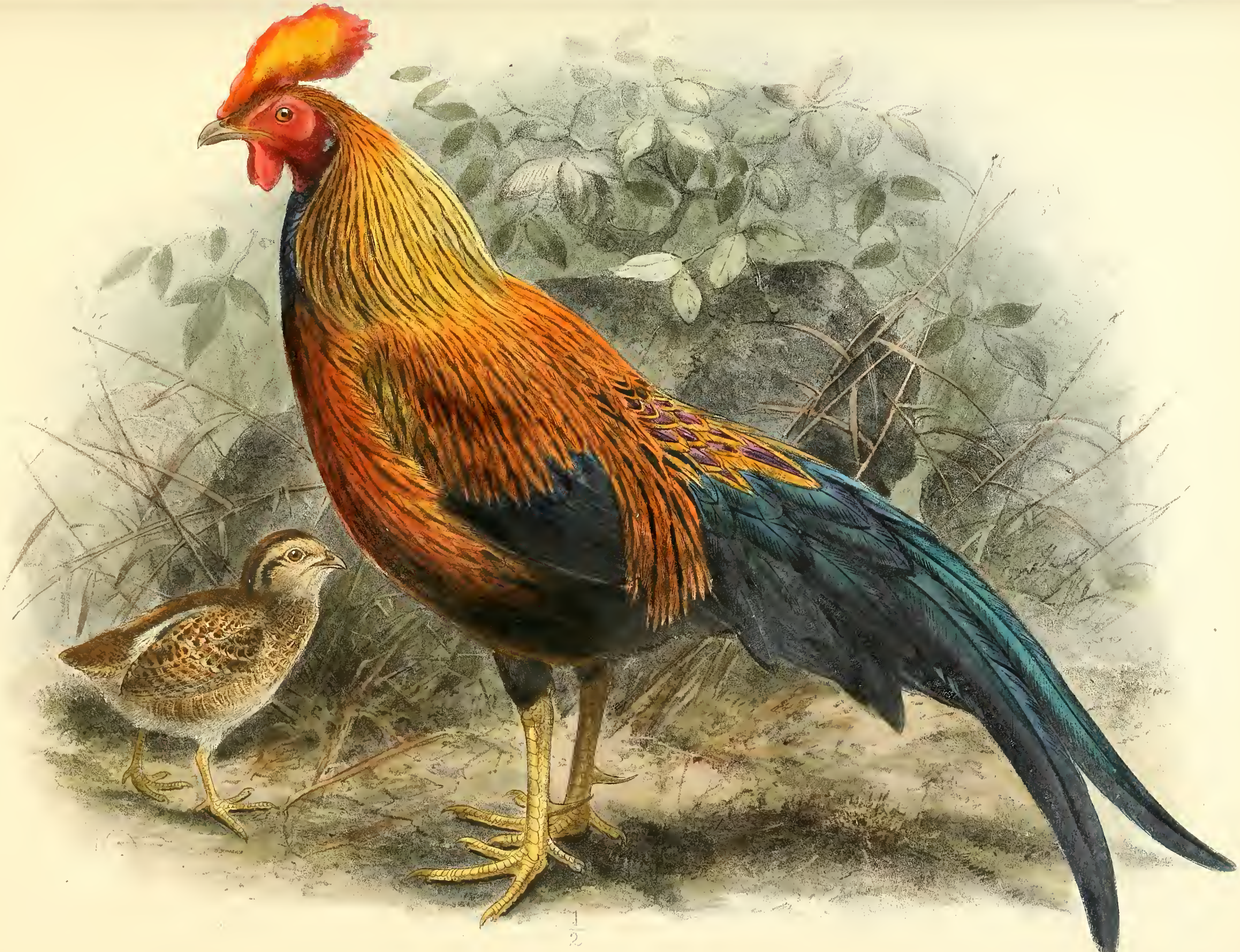
♂ *ad.* suprà aurantiaco-castaneus, plumis medialiter lanceolatim purpureis: uropygii plumis latè medialiter purpureis, dorsi colore angustè marginatis: supracaudalibus caudâque chalybeo-nigris et purpureo nitentibus: tectricibus alarum stramineis, medialiter castaneis et ad apicem lanceolatim dorsi colore notatis, majoribus et remigibus chalybeo-nigris: nuchâ cum collo postico et colli lateribus stramineis, plumis medialiter longitudinaliter nigro lineatis: facie, gulâ nuda et caruneulis pendentibus lividè rubris: gutture imo et jugulo purpureo nigris: corpore reliquo subtùs aurantiaco-castaneo, plumis longitudinaliter brunneo lineatis: abdomine, tibiis, crisso et subcaudalibus purpureo-nigris.

Adult male. Length of examples with fine tails (which vary in length) 26·0 to 28·0 inches; wing 9·2 to 9·5; tail 13·0 to 15·0; tarsus 3·2 to 3·4; middle toe 1·7 to 1·8, claw (straight) 0·5 to 0·6; bill to gape 1·2.

Length of comb from forehead to extremity 3·2 to 3·3 inches; spur 0·7 to 1·2.

Iris light golden yellow; face, throat, and wattles livid or purplish red; comb bright red, with a large interior yellow patch, brightest in front, and blending into the surrounding colour; bill brownish red, the lower mandible and tip of the upper pale; legs and feet wax-yellow, washed anteriorly with brownish, more especially on the toes.

Hackles and margins of the lesser wing-coverts pale shining golden yellow, changing into the glistening yellowish red of the back, median wing-coverts, chest, breast, and the lanceolate portion of the rump-feathers, and into the duller hue of the head and nape; the feathers with mesial stripes of deep brown on the hind neck and sides and of maroon on the remaining parts, those on the lesser wing-coverts spreading out at the base of the feathers, and more or less edged with dark brown; short feathers of the rump, upper tail-coverts, tail, greater wing-coverts, and outer webs of secondaries metallic greenish black, illumined on the rump with fine amethystine, and elsewhere with steel-blue, reflections; primaries dark brown; upper portion of the fore neck metallic purple-black; belly and



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GALLUS LAFAYETTII ♂, *pull*

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GALLUS LAFAYETTII. ♀, Juv ♂

thighs dull black, edged narrowly with rufous; lower part of the sides of the breast and under tail-coverts green-black; ear-coverts whitish, tipped with black.

Female. Length about 13·75 inches; wing 6·8 to 7·0; tail 3·5; tarsus 2·3 to 2·5; middle toe and claw 2·0 to 2·1; bill to gape 1·1.

Iris yellowish olive; bill, upper mandible dark brown, lower yellowish; tarsi and feet brownish in front, yellowish posteriorly.

Above fulvous-brown, the back, scapulars, and lesser wing-coverts with buff mesial lines, and the feathers closely vermiculated with black; the hind neck and sides dusky rufous, with the centres of the feathers blackish; primaries brownish, mottled and indented on their outer webs with rufous; secondaries and greater wing-coverts brownish black, handsomely barred with mottled bands of buff, the black on the terminal portions of the feathers mixed with rufous; tail rufous, mottled with black; chin and gorge whitish; fore neck and sides of chest brown, the former tinged with rufous, all the feathers with pointed white centres surrounded by a black edge; on the upper part and sides of breast the white increases, having a broad black margin; centre of the breast and belly white, marked with blackish brown, except on the abdomen; under tail-coverts as the tail. Specimens from the hills, in addition to being larger than low-country birds, are paler above.

Young. The male chick, when about the size of a Quail-Partridge and able to fly well, has the iris yellowish olive: bill. upper mandible brown, its tip and all the lower mandible yellowish; legs and feet dusky yellow, shaded with brownish; comb developed as a flap about $\frac{1}{10}$ inch high at the base of the upper mandible; spurs in the form of very small tubercles.

Forehead, sides of head, and nape ochraceous brown, a dark rufous, black-bordered, spear-shaped mark running up the nape to a point on the crown; from behind the eye a black stripe running down and back to the nape: interscapular region, scapulars, and wing-coverts rusty brown, mottled with black, the scapulars and coverts with marked white terminal spots and black bars, and the upper back with fulvous mesial lines; primaries brown, with fulvous edges; secondaries and tertials handsomely barred near the edges with buff and black alternately; least wing-coverts rufous; back blackish, edged with rufous and with two broad buff stripes on each side of the centre: chin, throat, centre of breast, and belly white; chest, sides of breast, and flanks light fulvous-brown, with wavy blackish cross rays and whitish mesial lines and tips; in the centre of the fore neck a pale rufous spot. This plumage resembles in general character that of the adult female.

Young male (January). In the bird of the year the iris is light yellowish, the bill much the same as in the chick; the comb and spurs but very little more developed, and the wattles are absent. A considerable change takes place in the plumage, however. The head and upper part of hind neck are yellowish rufous, the feathers with darker centres, deepening into chestnut-red on the interscapular region, sides of neck, and breast; on the lower part of the hind neck the feathers are somewhat elongated, with glossy blackish centres, and there are signs of the dark fore-neck patch; the metallic purple of the adult rump is present in small patches on the feathers; the ground-colour and the tail, which is short, are ferruginous, mottled with blackish, with a greenish-black wash on some of the tail-feathers; wings blackish brown, the secondaries and their coverts handsomely mottled with rufous and buff; chin and gorge whitish, the feathers very short; lower parts nigrescent, tipped with rufous.

Another specimen, not quite so old perhaps, is dark brown on the head; back ferruginous, mottled with black; the hind neck with the centre of the feathers blackish brown and their margins yellow; wing-coverts like the back: secondaries crossed with black-and-yellow mottled bars on the outer webs; primaries dark brown, indented outwardly with yellow; tail ferruginous, with black on the inner webs of the feathers; throat white; chest chestnut, feathers of the breast brown and ferruginous.

The adult plumage is apparently donned during the second year, and then the long tail is assumed, but this probably does not attain its full length until another year.

Obs. G. ferrugineus, the Red Jungle-fowl, and probably the origin of the Domestic Fowl, is an inhabitant of Northern and Central India, the countries to the east of the Bay of Bengal, and the Malay islands of the Sumatra-to-Timor chain, and is allied to the Ceylonese bird. It differs notably in having the breast and under surface dull greenish black; the hackles of the neck are deep red, the lower or longer ones which underlie the upper back are yellow with a dark mesial stripe; median wing-coverts deep maroon-red, the lesser and greater series dark green; quills cinnamon-red, brown internally. The wing of an Indian example in the national collection measures 8·0 inches.

The female has the back and wings mottled brown and tawny, many of the feathers with clear yellow shaft-stripes; the hackles are black, with tawny yellow edges; throat and sides of the neck maroon-red; the under surface cinnamon-brown, the feathers with a pale central streak and a paler shaft; tail blackish brown, the feathers mottled with ferruginous. A Javan example measures in the wing 8·0 inches.

The beautiful South-Indian Jungle-fowl, *G. sonnerati*, is larger than either of the above species (wing 10·0 inches) and is notable for the extraordinary structure of the hackles and wing-covert feathers, which terminate in a long lanceolate process, of a crisp leaf-like or waxen aspect, and which are of a glistening yellow-red colour. The feathers of the head and neck are very long, and are black with grey edges and bright white shafts, and a cross bar of the same, while at the tip there is a golden transverse spot; back dark greyish brown, the feathers with grey edges and shaft-streaks and mottled with the same colour; quills brown, with pale edges; secondaries glossed with green; longer upper tail-coverts purple and bronze; underparts grey, with a lanceolate black central streak on each feather, enclosing a white shaft-streak. This is a mere outline description of this species, which, one would think, ought to be found in Ceylon, as it is so common in South India.

Distribution.—The Jungle-fowl is more or less scattered through the dry jungly districts of the low country, and diffused throughout the hills of the Southern and Central Provinces. It is rather rare in the jungles of the maritime portions of the Western Province and south-western district, and is not common even in the forests of the interior. It is occasionally brought into Colombo and Galle by natives, but very seldom indeed into the former town. During my rambles in the jungles of the Hewagam and Rayigam Korales I never heard its note; but further inland, in the Three and Four Korales, in Saffragam, and in the Pasdum Korale, I have listened to its well-known cry. Likewise in the hilly jungles of the south-western district I have not met with it near the sea; but I have seen it about Oodogamma, and further up at the base of the ranges it becomes more plentiful. On the eastern slopes of the Morowak Korale, where a drier climate prevails, it finds a more congenial home, and along the Wellaway river and from that eastward it is numerous. In the maritime portions of the south-east it abounds, delighting in the dense *Euphorbia*-scrubs along the sea-coast. From this section of country round the east coast to the north of the island it is very numerous, and inhabits all the northern forests, extending down the west side as far south as the Kurunegala district. In the hills it is resident and breeds commonly up to about 5000 feet. On the Nuwara-Elliya plateau and up on the Horton Plains it is very abundant during the north-east monsoon, coming up from lower down on the hills, and probably, to some extent, from the low country, to feed on the berries of the nilloo. It is probable that many remain throughout the year in these uplands; but, as I have only visited the Horton Plains in the cool season, I am unable to say whether it is found in that locality to any extent during the wet season. In February and March, 1868, Captain Bayley of Galle informs me, they bred at the Horton Plains in great numbers.

Habits.—This handsome bird, although so very abundant in many parts, is by no means easy to shoot. It dwells entirely in cover, and, though it is fond of frequenting the vicinity of paths and tracks through forest, its sense of hearing is so acute that it removes to a safe distance at the sound of approaching footsteps; and though it will continue to utter its challenge-cry of "George Joyce," it gradually makes its way off behind some protecting hillock or rise in the ground which shuts out the road or path from its view. The north-eastern forests are well suited to its habits, the ground being covered with dry leaves, which do not decay so soon as in the humid jungles of the south; and among these, harbouring a multitude of seeds, insects, and grubs, it scratches exactly after the manner of its domestic race. This scratching may often be heard on a still morning at some distance away; and if the bird be behind a mound or little eminence it can be approached if the sportsman is cautious and makes no noise.

The Jungle-fowl roosts at a considerable height from the ground, choosing a good-sized branch to perch upon, and up to which it flies at an early hour in the evening; for the jungle swarms with hostile vermin, and its instinct teaches it to leave *terra firma* before the shades of evening spread a gloom through the thick forest. At daybreak in the morning they fly down from their roost, and while the cocks challenge each other with loud calls of "George Joyce, George Joyce," every now and then flapping their wings as they walk slowly about, the hens, if they have a brood of chicks to tend, lead them out into open places or into roads, where they scratch surrounded by their family, precisely after the manner of a barn-door fowl; and so intent are they in thus seeking food for their young, that I have walked down a road to within shot before disturbing them. The cocks are particularly combative in the breeding-season; and when the challenge-note is uttered, if there be another cock within hearing, he replies and flaps his wings, the call is continued, the birds approaching each other, and they will sometimes cross a road in so doing, and thus afford a shot.

I never could ascertain whether any actual combats were the result of their meeting, and I think that generally one or other of the birds retreats when it sees its antagonist.

Layard, however, writes on this subject :—"The cocks fight most desperately in defence of their seraglios, the combat frequently terminating in the death of one of the engaged parties. As they not unfrequently mingle with the fowls of the lonely villages, they cross with the domestic breed, being more than a match in courage for the plebeian dunghill cocks, and armed with tremendous sharp spurs.

"Mr. Mitford, of the Ceylon Civil Service," he continues, "showed me, while at Ratnapura, a hybrid hen; her general appearance and call much resembled that of the wild bird; her eggs also partook of the spotted character; but Mr. Mitford never succeeded in rearing any chicks from them, as they were always addled. The bird was very tame to those with whom she was acquainted, but fled precipitately at the approach of strangers."

As a rule, Jungle-fowl do not thrive well in confinement; but several exceptions to this have come under my notice, the birds in question having been reared from the nest. Captain F. Bayley successfully kept a cock for years in his beautiful grotto-like aviary at Galle; and Mr. Thwaites of Hakgala had some beautiful examples which I saw on the occasion of my last visit to his bungalow, and which, he informed me, he had had for some years in confinement without their having in any way suffered from their captivity. Mr. Holdsworth likewise conveyed some to England which the late Rev. Dr. Boake had reared in an aviary at Colombo.

The sound of the flapping of the wings, which is of course the invitation to battle, has the effect of always drawing two birds together; and the knowledge of this fact has given rise to the device of imitating the noise, by doing which the sportsman can bring the cock up to him, and if he be properly concealed can easily shoot him. The natives make this sound by clapping against their thighs with the palm of the hand hollowed; but Europeans can best do it by making a pad with the handkerchief, and beating it against the palm of the other hand. By this means the *exact* sound can be made; and I myself once procured a very fine specimen in the Ostenburgh woods by adopting this plan. It is worthy of note that this species (and I believe the same is the case with all the wild Jungle-fowl) does not utter its call before daybreak, like the domesticated varieties; and this fact renders it difficult to surmise how the habit first arose in the latter.

The male birds have an alarm-note, sounding like *clock, clock,* which they make, if they hear any strange noise, when perched on a branch and about to roost. I kept a wild bird in confinement for a short time, and being very timid it invariably made this note when I approached, at the same time running round the aviary and trying to escape. The *George-Joyce* call is, as Mr. Holdsworth remarks, preceded by a sharp monosyllabic note sounding like *tek.* This gentleman likewise says that he has seen the cock, when "calling," "strutting up and down a low horizontal branch of a tree, raising and lowering its head" as it gave out its note.

I have remarked in my note on "distribution" that numbers of Jungle-fowl visit the forests in which the undergrowth of "nilloo," a species of *Strobilanthes,* is so abundant, for the purpose of feeding on its berries; and the popular idea obtains that the fruit of this shrub has the effect of stupifying the birds. Certain it is that at this period the Jungle-fowl in the Horton Plains and about Nuwara Elliya do become affected, and are apparently so "intoxicated" that they may be knocked down with a stick. Mr. Holdsworth writing on the subject says that he failed to discover that any thing was known to botanists of the seeds of this plant possessing narcotic qualities; and he suggests that the birds may perhaps eat some noxious fungus growing in the woods where the "nilloo" thrives.

Another idea among the Singhalese is that the Jungle-fowl become blind at this season from eating the nilloo-seeds. Mr. Bligh writes me on this subject as follows :—"About that season of the year if village fowls be brought to the hills they rarely escape a serious eye-disease, which rapidly spreads throughout a given district, and in many cases they become totally blind in two or three weeks. This is the disease which the Jungle-fowls evidently catch. A dog of mine caught a jungle-cock with one eye lost, and evidently from this cause."

The flight of the Jungle-fowl is strong; but they rarely take wing unless suddenly surprised, their usual mode of escape from danger being by running, which they do with considerable speed.

Nidification.—In the north of Ceylon the Jungle-fowl breeds in the early part of the year (when I have procured its eggs), and most likely at other seasons as well. In the Hambantota district I have met with

young chicks in July, and in the neighbourhood of Kaduganuawa in December, whilst at Horton Plains young have been seen in April; and, finally, in the Kukul Korale I have taken its eggs in August. From this it will appear that it breeds throughout the year. The nest is almost always placed on the ground near a tree, under a bush, and beneath the shelter of a fallen log; a hollow is scratched and a few dry leaves placed in it for the eggs to repose upon. I once found a nest in damp soil between the large projecting flange-like roots of the Doon-tree, containing two eggs partly incubated. I have generally found that the eggs do not exceed two in number, but sometimes three and occasionally four are laid. The general colour is creamy, but some eggs are whiter than others; white specks sometimes prevail all over the shell in the same manner as in the ordinary hen's eggs. Sometimes they are closely stippled with brownish specks or minute points of reddish grey, which occasionally tend slightly to form an indistinct zone at one end, either the smaller or larger. They vary from 1·75 to 2·0 inches in length by from 1·24 to 1·49 inch in breadth.

In 1873 Mr. Parker found a nest on the top of a young tree about 30 feet high. He writes me that it had the appearance of a Crow's or a Hawk's nest, of which the Jungle-hen had taken possession. She flew off, and three eggs were found to be in the nest. After incubation the young would have been doubtless carried down by the mother to the ground, just as young ducklings are conveyed from a tree-nest to water.

The young chicks, when slightly larger than a Quail, fly well and very strongly; they show their *Galline* nature in displaying a strong affection for the parent. I once shot a hen which was accompanied by a brood of half-grown chicks, and as I approached they ran to and fro by the dead bird until I was close to them, when they flew off.

The figures in the Plate represent a cock from the Trincomalie district, a female from the Horton Plains, and a chick shot on the summit of Allegala Peak.

Genus GALLOPERDIX.

Bill straighter than in *Gallus*, the culmen less curved and flattened at the base; nostrils lateral and elongated, placed in a capacious membrane; the margin of the mandible widened beneath the nostril and suddenly compressed towards the tip. Wings pointed, the primaries acuminate; the 6th quill the longest, and the 1st and 2nd much curved. Tail short, divaricate, and of 14 feathers. Tarsus moderately long and stout, covered in front with pentagonal scales, and armed with long spurs, the number on one leg sometimes exceeding that on the other. Middle toe exceeding considerably the lateral ones, which are subequal.

Head and throat feathered, but the orbits nude. Tail held erect.

GALLOPERDIX BICALCARATA

GALLOPERDIX BICALCARATA.

(THE CEYLON SPUR-FOWL.)

(Peculiar to Ceylon.)

Perdix bicalcarata, Forster, Ind. Zool. p. 25, pl. 14 (1781).
Tetrao zeylonensis, Gmel. ed. Syst. Nat. i. p. 759 (1788).
Perdix bicalcaratus, Pennant, Ind. Zool. p. 40, pl. 7 (1790).
Perdix ceylonensis, Lath. Ind. Orn. ii. p. 644 (1790).
Galloperdix zeylonensis (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 241 (1849); Gould, B. of Asia, pt. vi. (1854); Jerdon, B. of Ind. iii. p. 545 (1864); Hume, Nests and Eggs, iii. p. 555 (1875).
Galloperdix bicalcaratus (Forst.), Kelaart, Prodromus, Cat. p. 131 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 105.
Galloperdix bicalcarata (Forst.), Blyth, Ibis, 1867, p. 308; Holdsw. P. Z. S. 1872, p. 469; Legge, Ibis, 1874, p. 26, et 1875, p. 400; id. J. A. S. (Ceylon Br.) 1874, p. 49; Hume, Str. Feath. 1878, vii. p. 430; id. *t. c.* p. 453.
Das zweigespornte Rebhuhn, Forster, *l. c.*; *Double-Spurred Partridge*, Pennant; *Chittygong Partridge*, Latham (female); *Ceylon Partridge*, Gmelin and Latham; *Spur-fowl*, *Spurred Partridge*, *Kandy Partridge*, Layard.
Haban-kukula, *Saban-kukula*, Sinhalese.

♂ suprà niger, plumis medialiter albo lineatis: dorso, uropygio et supracaudalibus saturatè castaneis, apicaliter obsoletè nigro angustissimè transfasciatis: scapularibus castaneis nigro vermiculatis, medialiter nigris albo lineatis: tectricibus alarum dorso concoloribus, marginaliter castaneis nigro vermiculatis, majoribus subterminaliter albo maculatis: remigibus brunneis, secundariis extùs castaneo vermiculatis: supracaudalibus longioribus caudâque nigricanti-brunneis: pileo summo nigro, immaculato: collo laterali et corpore subtùs nigris, albo conspicuè flammulatis, hypochondriis longitudinaliter albo notatis: subalaribus nigricantibus: remigibus subtùs pallidè cinerascentibus: rostro rubro: plagâ nudâ orbitali rubrâ: pedibus rubris: iride brunnescenti-flavâ, interdum rubescente.

Adult male. Length 13·5 to 13·8 inches; wing 6·4 to 6·6; tail 4·0; tarsus 2·0 to 2·1; middle toe and claw 1·6; bill to gape 0·95 to 1·0; spur 0·5 to 0·7, generally two on each leg, sometimes three on one and two on the other.

Iris brownish yellow or brownish red; orbital skin red; bill, legs, and feet red; spurs dusky reddish.

Top of head, hind neck and its sides, interscapular region, lesser wing-coverts, tail, and under tail-coverts black, most intense on the hind neck, slightly pervaded with brownish on the wing-coverts and tail, and blending into the rufous-chestnut of the back, rump, and tertials; head and hind neck striated with white, broadly so on the latter part, and changing into narrow drop-shaped mesial spots on the wing-coverts; lower back and tail-coverts with terminal cross rays of blackish, and the major wing-coverts, tertials, and outer webs of secondaries mottled with the same; primaries brown; face, throat, and under surface white, margined with black: from the chin to centre of fore neck narrowly edged with it, the margins increasing on the lower part of the fore neck, and covering half the feathers on the sides of the same; on the breast the lateral margins are very broad, decreasing at the tip; on the flanks the black increases, leaving a narrow mesial white stripe; thighs and under tail-coverts black, with terminal white spots.

Female. Length 11·75 inches; wing 6·0; tail 3·5; tarsus 2·0; spurs 0·3 to 0·5, one on each leg generally, sometimes two on one leg, and at times wanting on one.

Iris brownish yellow; bill, legs, and feet lighter red than in the male.

Head and hind neck blackish brown, changing into ferruginous on the back and wings, which are finely pencilled with rays of dark brown; head with pale mesial lines; quills brown; outer webs of secondaries mottled with rufous; tail blackish brown; chin and throat albescent, the feathers dark-edged; chest and under surface chestnut, the feathers with pale shafts and dark mottlings, aud the fore neck and chest with dark brown lunulations; under tail-coverts blackish brown, mottled with rufous.

Young. In nestling plumage the sexes are alike, and resemble the female adult birds.
Iris brownish red; bill dusky red, with dark tip; legs and feet dusky red; tarsus with blunt tubercles.
Head with fulvous centres to the feathers; upper plumage ferruginous, mottled as in the female; throat whitish.
In some young examples which I kept in confinement the breast was mingled with white feathers. The wing measures during the first year from 5·5 to 6·0 inches.

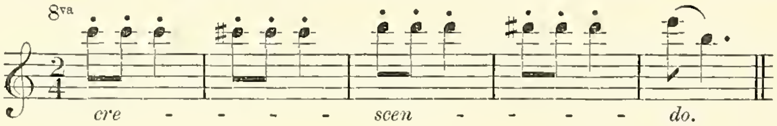
Obs. This species is distantly allied to the handsome "Painted Spur-fowl" of South India (*G. lunulosus*, Valenciennes), which differs in the spotted character of its plumage and in not having the underparts marked with white. A male example in the national collection measures 5·6 inches in the wing. The head, neck, and back are rich ferruginous chestnut, each feather with a black terminal spot enclosing a white one; scapulars, wing-coverts, and inner tertials deep glossy brown, spotted with white; lesser and median wing-coverts richer chestnut than the back, with greenish-black spots enclosing a white mark; wings ferruginous brown; tail blackish green; chest and breast fulvous buff, with blackish spots; flanks deep chestnut, with black terminal spots, crossed by a black bar.
Galloperdix spadiceus (Gm.), the Red Spur-fowl, is found in the south of India; wing 5·7 inches. The male is brownish chestnut above, with pale edges to the feathers; the female, which is a very handsome bird, is rufous buff above, mottled with brown, and the feathers of the hind neck, back, and wing-coverts handsomely barred with very broad bands of black; fore neck the same; the breast and flanks ferruginous, the breast-feathers with black crescentic tips, and the flanks with mottled bars of blackish brown.

Distribution.—The Spur-fowl is a bird of rather singular distribution in Ceylon, inhabiting the damp jungles of the west and south-west, the forests of the Central Province permanently up to an altitude of 4500 feet about, and those of the southern ranges as well; likewise the Eastern-Province jungles, but not the northern portion of the island. How far northward of the Matale Hills it extends I am unable to say; but I have myself not heard it north of Dambulla, nor on the sea-coast beyond the Virgel. On the western side it is found in the southern portions of the Kurunegala district, straying as far north as Uswewa, and about Ambepussa is not uncommon; further south it increases, and is found in various forest and jungle recesses in the Hewagam and Salpiti Korales. In Saffragam and in the Pasdun Korale it is abundant, and extends in numbers throughout the wooded districts between Galle and the southern hills, in which latter it is likewise common. Eastward of the Kolonna Korale it is rare. I heard it once on the banks of the Kirindeganga in the Wellawe Korale; but higher up, on the slopes of the mountains, it is again common. In the Friars-Hood jungles and about Nilgalla it is plentiful in parts, though not widely distributed as in the damp woods of the western district. It is found more or less in all the jungles of the coffee-districts, and breeds above 5000 feet in some parts; in the cool season it is found in the Nuwara-Eliya district, and very probably extends over all the plateau to the Horton Plains. It is very common in the Knuckles forests.

Habits.—The "Haban-kukula," so well known in Ceylon on account of its remarkable cackling note, is one of the shiest birds in the island, affecting the most entire concealment, and only emerging from the jungles in the early morning. It is so wary that, although it may occasionally be surprised or heard close to a path in the forest, it immediately becomes aware of the presence of the enemy, and runs off with great speed, instantly disappearing in the thick jungle. It does not, however, confine itself entirely to forests, as I have sometimes found it in *Lantana*-scrub and detached copses in the south-west of the island; and I have more than once, by rushing into a small thicket with shouts, endeavoured to get it on the wing, but have always failed, as it invariably escaped by darting through the grass and underwood on foot, and thus gained the main portion of the jungle in safety. On the coffee-estates in the Central Province it comes out of the forest the first thing in the morning, and feeds along the edge of the plantations in silence; almost before the sun is up it retreats into its native fastnesses, and about six or half-past commences to call. There is something highly ventriloquistic in its note; and this, combined with the birds moving about, as I believe they always do when they are calling, makes it impossible to get near them by following the sound of their notes. These are given out and answered by the cocks; and if disturbed during the time they are cackling, they will wait a little, and then recommence louder than ever.

Layard writes as follows on their habits:—"After remaining some time concealed, if nothing occurs to excite their fears, a cock-bird, bolder than the rest, will utter a few low notes, not unlike the plaintive cry of a

turkey poult; if this is answered from a distance, or the birds are reassured by the total silence, the call is changed to a loud piping whistle, of which the following stave gives the nearest representation I can devise:—



and the birds once more sally out from their concealment. I am convinced that, like the Virginian Quail, these birds possess the power of ventriloquism in a great degree. I have often listened to those in my aviary, and could have declared that the calls proceeded from every part of the garden save that in which the performers were located. . . . .

"They fly with great rapidity, but prefer to take refuge in concealment rather than maintain a lengthened flight. One which escaped from a basket in my house flew up to the roof and through the ventilating-holes; but instead of continuing on the wing at the elevation it had attained, it dropped instantly into a small copse, out of which it was hunted with much difficulty, when it darted through an open door into my kitchen and concealed itself behind a box.

"The males are very pugilistic, and in their manner of fighting reminded me of the game-cock, depressing and elevating the head, imitating each other's actions, &c."

Though they seem to do well in confinement for a short time, I do not think they would ever live long in a state of captivity, their nature being naturally so wild and shy that they are unable to adapt themselves to the confined life of an aviary. I kept a brood of four, which were brought to me quite young, for eight months, at the end of which time they were stricken with some disease which carried them off one by one. They were at all times very shy, hiding behind the artificial cover with which I provided them, and whenever they were frightened flew up against the bamboo covering of the "run" in which I kept them, sadly lacerating their heads. The injuries thus received, however, did not appear to affect their health, as one individual lived for months with a bare skull, which he acquired by dashing his head repeatedly against the roof of the aviary. They were confined with an old male bird, and did very well for about a month, until they grew up, when they commenced to fight with the cock; and after that they became very shy and restless. When about six months old they began the regular call, uttering it generally about 11 o'clock; but prior to this they made a chirping note, something like that of a young fowl.

Mr. Holdsworth brought some specimens to England, but writes that, "although apparently strong and well, they all died within three days after the ship entered the Thames." This gentleman also states that numbers are trapped by the natives in the upper hills, hair nooses being, I believe, used for this purpose.

Nidification.—The Spur-fowl breeds from April till July or August in the low country, and, I believe, about the same period in the hills. I found a nest on the 17th of July, 1872, on one of the islands in the Ambalangoda Lake; it was situated under an overhanging rock, on stepping on the top of which I flushed the bird from beneath me. She ran a little distance, and then flew off with a loud whirr, like that of a Grouse. It was merely a slight hollow scraped in the ground, with one or two dead leaves on the bottom to serve as a lining; the eggs were two in number, and evidently in this case formed the entire clutch, as they were slightly incubated. I have, however, seen four young in a brood, and Mr. Bligh has met with five. He writes me:—"I once came upon a family of Spur-fowl in large open jungle; the hen flew off at once, warning the brood, which were not larger than Sparrows, with a loud cackling scream, to do the same; they all flew into the bushes and trees. I watched one little fellow fly about 10 yards, and alight on the bole of a large tree some 12 feet from the ground, and cling to a tuft of lichen with which the trunk was covered: so closely did the little bird squat that I had some difficulty in seeing it when I reached the spot; when I disturbed it I was surprised to see it dash away into the jungle with a strong flight, though only a tiny 'chicken.' As old birds most frequently take to thick bushes when disturbed by dogs, from which I have shot them, I expect it is a constant habit of the young to do so too."

The eggs in the nest above mentioned were of a uniform cream-colour, and one of them was covered with small, white, polished, calcareous specks, similar to those often seen on hen's eggs. They were rather broad ovals in shape, and measured 1·42 and 1·43 inch in length by 1·12 and 1·12 inch in breadth respectively.

The figures in the Plate are those of a male and a female from the Southern Province.

GALLINÆ.

Fam. TETRAONIDÆ.

Bill stout, shorter than in Phasianidæ, usually plumed to the base of the nostril. Wings ample, round, but often pointed. Tail usually short. Tarsus short and stout, spurred in some.

Of moderate size, neck short; of stout form; plumage of some differing slightly in the sexes.

Genus FRANCOLINUS.

Bill stout, rather long, wide at the base, culmen curved from the tip; nostrils placed in a capacious membrane. Wings rather short, pointed, the quills acuminate, the 5th quill the longest; secondaries exceeding the primaries. Tail of 14 feathers, longer than in *Perdix*, rounded. Legs and feet stout. Tarsus longer than the middle toe, covered in front with two rows of pentagonal scales. Lateral toes short, the inner less than the outer; hind toe and claw short.

FRANCOLINUS PICTUS.

(THE PAINTED PARTRIDGE.)

Perdix picta, Jard. & Selby, Ill. Orn. pl. 50 (1848–52).

Francolinus pictus (J. & S.), Blyth, Cat. B. Mus. A. S. B. p. 251 (1849); Jerdon, B. of Ind. iii. p. 561 (1864); Blyth, Ibis, 1867, p. 158; Holdsw. P. Z. S. 1872, p. 469; Hume, Nests and Eggs, iii. p. 7 (1875); Butler & Hume, Str. Feath. 1876, p. 7; Fairbank, *t. c.* p. 262; Butler, ibid. 1877, p. 211; Ball, *t. c.* p. 419; Davidson & Wender, ibid. 1878, vii. p. 87; Ball, *t. c.* p. 225; Hume, ibid. List B. of Ind. 1879, p. 111.

The Painted Francolin of some writers; *The Fort-Macdonald Partridge* of the Planters. *Kala-titar*, Hind.; *Kakkera-kodi*, Telugu.

Adult male. Length "12 inches" (*Jerdon*); wing 5·6 to 5·8; tail 2·5; tarsus 1·6; middle toe and claw 1·35; bill to gape 1·1.

The above measurements are from Indian examples which I have examined.

"Iris dark brown; bill blackish; legs yellow-red" (*Jerdon*).

(Deesa, Bombay Presidency.) Forehead, face, ear-coverts, and a broad stripe passing from above the eye down to the sides of the nape yellowish rufescent, which colour forms the margins of the feathers beneath the ears and across the hind neck; feathers of the hind neck blackish at the centres, each on the lower part with four round spots opposite one another; prevailing colour of the scapulars and wing-coverts yellowish rufescent, the scapulars with black centres divided by an arrow-shaped mark paler than the edgings; wing-coverts with the rufous portion divided into spots by a blackish central mark; feathers of the back, rump, and upper tail-coverts crossed with alternate black and white bars, tinged on the upper part of the back with fulvous; primaries and secondaries brown, crossed with wide bars of rufescent yellow, which are narrowest on the inner webs; upper tail-coverts iron-grey, barred with combined black and white bars; tail brownish black, barred near the base with white.

General ground-colour of the under surface white, tinged with fulvous on the flanks, abdomen, and throat; fore neck marked with black mesial lines, gradually spreading out on the chest into bars and central marks enclosing round

opposite spots situated near the margins of the webs; on the breast and lower flanks these markings change into bars; under tail-coverts dark cinnamon-rufous; under wing-coverts fulvous, barred with dark brown, greater series light brown.

Female (Wellemade, Ceylon). Length 11·5 to 11·75 inches; wing 5·3 to 5·7; tail 2·9 to 3·1; tarsus 1·6; middle toe and claw 1·3; bill to gape 1·0 to 1·1.

Iris yellow-brown; bill brownish, the under mandible fleshy, with the tip dusky; legs and feet yellowish red; claws dusky.

Lores, face, and ear-coverts tawny rufous, extending high over the eye; centre of forehead, head, and nape brown, narrowly edged with tawny; chin and throat buffy white; centre of the hind neck dark brown, the feathers broadly edged with buff; lower part of the hind neck with white marginal spots, lengthening out into streaks on the interscapnlar region; back blackish brown, crossed with narrow pale wavy marks, which increase in breadth and become white on the tail-coverts; wing-coverts barred and margined near the tips of the feathers with tawny yellow; quills not so black as in the male, barred with rufous tawny; the tertials with spear-shaped cross marks and edges of yellowish buff; under surface whitish; fore neck marked with arrow-shaped bars, and the rest of the underparts, except the belly and vent, crossed with broad irregular bands of black, the lower flanks tinged with buff; abdomen greyish white; under tail-coverts as in the male.

The female differs from the male in the less conspicuous marking of the hind neck and the interscapular region, and in the somewhat different character of the markings of the chest and fore neck.

Young. Immature birds have the legs and feet duskier than the adult.

The subterminal lateral stripes of the feathers of the back, scapulars, and tertials are paler, and the throat and under surface whiter; the rufous of the under tail-coverts is not so dark as in the adult, and is barred with black.

Obs. I have not been able to compare a large series of continental birds with my Ceylonese specimens, and therefore I am unable to say whether the differences I have observed in the two races are constant. As regards the males, I am, I regret to say, not in a position to offer any opinion, as all my efforts to procure a male were unsuccessful, and my friends who promised to help me in the matter have not as yet sent me any specimens. The few birds which I shot on two occasions were all females or young birds. Females from India, however, though resembling their insular relatives in most respects, differ in being more rufescent beneath, and the bars on the chest are closer and not so pointed at the centre; the markings on the hind neck resemble more those of the male than in the Ceylon bird, being more in the form of spots than longitudinal bands.

I submitted my specimens to Captain C. H. Marshall, one of our greatest authorities on Indian game-birds, when he was lately in England; and his opinion was that, though differing in these slight respects, they could not well be specifically separated from the Indian form. A comparison of the males, however, is necessary before we can be certain about the matter; and should the Ceylon race eventually prove distinct, I would propose for its title the name *watsoni*, after Col. Watson, one of the oldest sportsmen in Ceylon, who was perhaps the first ever to procure the bird.

It appears that this species and the Black Partridge (*F. vulgaris*) interbreed in the north-west of India. Captain Butler describes hybrid specimens, which he obtained in the Deesa district, in the seventh volume of 'Stray Feathers' (1877, p. 211); and one of them I have had the opportunity of seeing, owing to the kindness of Captain Marshall. It has the centres of the frontal feathers, a broad line passing from the nostril through the eye and down the sides of the head, the chin, together with the tips of the throat-feathers and the ground-colour of the chest and breast *jet-black*; the lower hind-neck feathers are jet-black, with the spots quite circular, and the abdomen and vent more rufescent than in *F. pictus*.

The male *F. vulgaris* has the throat, face, neck, chest, breast, and most of the flank-feathers, together with a broad eye-stripe, jet-black; cheeks and ear-coverts white, and round the neck a collar of chestnut; back and rump barred black; under tail-coverts chestnut. The female is not unlike *F. pictus* in general appearance, but has the chestnut collar, whereby it can at once be distinguished.

Distribution.—The Painted Partridge inhabits the patna-hills which form the upland basin lying between the western slopes of the Nuwara-Eliya range and Badulla in the one direction, and the Udu-pusselawa hills and the Haputale range in the other. It is also found about Haputale and Haldamulla, and on the subsidiary patna-hills between Lemastota and Wellaway. Its range, therefore, is extraordinarily restricted, as far as we know at present. In the last-mentioned district Mr. Bligh has observed it; and it is very probable that it may extend westward into the hilly country which forms the elevated grassy and openly-timbered plateau situated

in the Meda Korale, and which is such a conspicuous piece of country when seen from the Haputale coffee-estates.

It was first made known as a Ceylonese bird by Mr. William Ferguson, who addressed a letter to the 'Observer' newspaper on the 7th of December 1865, calling attention to the existence of a species of Partridge, which he concluded was *F. pictus*, specimens of which had then recently been shot by Mr. Wright in Haputale. This gentleman had met with a flock of six, out of which he procured his birds. A few days after this a second letter appeared in the 'Observer,' from an old sportsman, who affirmed that the same Partridge had been shot in 1848 by Messrs. Poigndestre and Tapp in the same district; and that year would therefore seem to be the earliest date concerning which any published notice of the bird's occurrence was given out. Colonel Watson, of Kandapolla, however, who is one of the oldest sportsmen in Ceylon, informed me that he had shot this bird forty years ago, in the neighbourhood of Fort Macdonald; and, as full reliance may be, I am sure, placed in his identification of the bird, he was, in all probability, the first Englishman who met with it in Ceylon.

On the mainland this Partridge has a tolerably wide range. On reference to the 'Birds of India,' we find the following sketch of its distribution:—"The Painted Partridge may be said to take the place of the Black in Central and part of Southern India. It is found throughout Bundelkund and the Saugor and Nerbudda territories, and thence south through Nagpore and the Deccan, about north latitude 15°, gradually becoming more scarce southwards. I have heard of its occasional occurrence near Bangalore, still further south, but where the land is higher and the climate colder. West it extends into Kandeish and perhaps Guzerat, but is not known on the Malabar coast; and eastwards it is found throughout Chota Nagpur and adjacent lands to the more open parts of the northern circars as far as Cuttack, but far more rare there than on the coast of the peninsula. I have found it most abundant in the Deccan, near Jaulna, and at Mhow, less so in Saugor, Nagpore, and Hyderabad."

As supplementary, and confirming these remarks, we gather from 'Stray Feathers' that the Rev. Dr. Fairbank found it in the Deccan in bushy places; and Messrs. Davidson and Wender state that in this same locality it is common. Mr. Ball met with it on the borders of the Patna and Karial districts, and records it likewise from Raipur, in the Central Provinces. As regards its occurrence in Chota Nagpur, however, he speaks with some doubt, remarking that he has never seen it north of the Mahanadi, and that the only species he met with in the Division was the Black Partridge. With regard to the north-west of India, Captain Butler remarks that it is common on the plains adjacent to Mt. Aboo, but that it does not ascend the hills; and Mr. Hume adds that it is likewise frequent in Kattiawar, and that he has seen it from Anadra, Sirdhi, and Erinpoora, localities in the surrounding district. In 'Nests and Eggs,' this author speaks thus of its range:— "It is found in suitable country in most parts of the northern half of the peninsula of India, extending northwards as far as a line drawn from the Runn of Cutch to Gwalior, and from this latter to Ganjam."

Habits.—This handsome Francolin frequents the low scrub, bushy growth, and maana-grass and bracken-thickets which cover the patna-hills stretching from Fort Macdonald across to the lofty Haputale range. This singular tract of country, which I have so often had occasion to refer to in this work, and which I have styled the Uva patna-basin, is one of the most remarkable upland regions in Ceylon. Viewed from the summit of Totapella, which towers, on its south-eastern border, some 3500 feet above the general level of the tract, it has the appearance of a hillocky upland plain, bounded on all sides by high mountains. Let us, however, descend through the forests, and cross the Wilson's bungalow and Haputale track, and we find the plain has become transformed into a maze of steep-sided hills, which rise from 400 to 800 feet from the bottoms of the deep gorges, which are drained by a number of streams flowing towards Attampitiya, to form the southern affluents of the Mahawelliganga. These steep "braies," and the high ground between the valleys, are clothed with a tangled mass of scrub, bushes, and lofty maana-tussocks, which, blended together by distance, had the appearance from the top of the mountain of ordinary grass; here and there this vegetation is broken by patches of jungle following the course of the streams, or varied by the presence of green paddy-fields, such as those round Fort Macdonald and Wellemade, and which are the resort of numerous Snipe in the cool season.

Such is the stronghold of the Painted Partridge in Ceylon; and no description of country could be better suited to the skulking habits of this bird. It resorts to hollows and moderate slopes, thickly covered with bushes and grass, and never seems to come into the open except in the early morning or in the evening after

a heavy shower of rain, when the cocks resort to the tops of the white-ants' hills and give out their harsh cry. With a dog they may easily be found, but without it is difficult to flush them. By marking the spots from which the crowing came, I generally found the birds in clumps of grass and bushes, of about 3 feet high or less, out of which I put them by running into them with a shout. They fly straight and with considerable speed, and were, as far as I can judge, usually in pairs. My friend, Mr. Edward Watson, informed me that he had often shot, with the help of a dog, several brace in an afternoon at the same locality (Wellemade) of which I now write. The flesh of this Partridge is good eating, and would, no doubt, be much improved could it be kept as in a cold climate.

Jerdon, who was a keen observer of the habits of Indian game-birds, has the following paragraph on this species :—"It delights in grassy plains and fields, but more affects open, dry, and raised plains with scattered bushes than the low-lying damper meadows that the Black Partridge delights in. It is always when the grain is ripe, as well as at other times not unfrequently, to be found in wheat-fields and other cultivated lands, occasionally in open and grassy glades in the midst of thin forest-jungle. It chiefly occurs in pairs, now and then several, not far from each other. Early in the morning the cock bird may be heard uttering his peculiar guttural call or broken 'crow,' *chee-kee-kerray, chee-kee-kerray,* which can be heard a very long way off, though by no means loud, and is answered on all sides. On approaching the spot whence the sound proceeds, if carefully looked for, he may be seen seated on the stump of a tree or a thick bush, or an ant-hill, or other elevated spot; but when he finds himself discovered, he sinks down and runs off in a way that puzzles dogs much. . . . . . . When the grass is not too high, the Painted Partridge affords very fair shooting with a steady pointer, as also in the wheat-fields in November and December, when the birds have scattered. I have seen this bird perch on a low tree, but very rarely, and only when disturbed by a dog."

I have no doubt that the Uva birds take to the rice-fields in the same way when the grain is ripe. The food of all the specimens I shot consisted entirely of black ants. The cry, as noticed by myself, resembled the syllables *quserk-quserk-quserk,* and was one of the most singularly harsh and grating bird-sounds I have ever heard.

Mr. Blewitt writes that "it is peculiarly active, uttering a low *click, click* while it scratches up the ground for food; or it will roll itself in the dust and nestle on the ground with apparent delight, all the while uttering the low *click, click.*"

Nidification.—As I procured immature birds at Wellemade in May, I presume this Partridge breeds during the November and December rains in Uva. According to Mr. Blewitt it breeds at Jhansi in July and September, its nest being placed on the ground in a slight excavation, and under the shelter of a bush or thick patch of grass; it is made of roots of grass and grass itself. The regular number of eggs is seven or eight; and in shape "they are very broad and obtuse at the large end, and much pointed towards the small end." "The colour," writes Mr. Hume, "varies a good deal; some eggs are drabby white, with a faint greenish tinge, others are brownish drab, others cream-colour, and some pale *café au lait.*" They are spotless, and measure 1·39 by 1·16 inch.

Genus ORTYGORNIS.

Bill wide and lengthened, the tip well produced over the under mandible. Nostrils basal and oval. Wings rather pointed; the 3rd and 4th quills the longest; tertials equal to the primaries. Tail of 12 feathers, moderately long, slightly exceeding the coverts. Tarsus stout, longer than the middle toe and claw, and armed with a large spur in the male; lateral toes equal.

ORTYGORNIS PONDICERIANA.

(THE GREY PARTRIDGE.)

Tetrao pondicerianus, Gmelin, Syst. Nat. i. p. 760 (1788).

Perdix orientalis, J. E. Gray & Hardw. Ill. Ind. Zool. pl. 56 (1830–32).

Perdix ponticeriana (Gmel.), Blyth, Cat. B. Mus. A. S. B. p. 252 (1849).

Francolinus ponticerianus (Gmel.), Kelaart, Prodromus, Cat. p. 131 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 107.

Ortygornis ponticeriana (Gmel.), Jerdon, B. of Ind. iii. p. 568 (1864); Blyth, Ibis, 1867, p. 158; Holdsw. P. Z. S. 1872, p. 469; Blanford, Zool. Persia, p. 273 (1872); Adam, Str. Feath. 1873, p. 392; Ball, ibid. 1874, p. 427, et 1875, p. 209; Hume, Nests and Eggs, iii. p. 542 (1875); Butler & Hume, Str. Feath. 1876, p. 6; Fairbank, *t. c.* p. 262; Hume, *t. c.* p. 459; Davidson & Wender, ibid. 1878, vii. p. 87; Ball, *t. c.* p. 225.

Ortygornis pondicerianus, Hume (List B. of India), Str. Feath. 1879, p. 111.

Francolin à rabat, Temm. Pl. Col. 213; *The Pondicherry Partridge*, Kelaart; *The Red-legged* also *Jaffna Partridge*, Europeans in North of Ceylon. *Titar*, Hind.; *Gora-titar*, of some; *Kawunzu*, Telugu; *Koudari*, Tam. (Jerdon); *Jirufti*, in Persia (Blyth); *Kowthari*, Ceylonese Tamils.

Oussa-watua, Sinhalese.

Adult male. Length 12·0 to 12·3 inches; wing 5·5 to 5·8; tail 3·2 to 3·4; tarsus 1·7 to 1·8; middle toe 1·2; hind toe and claw 0·55; spur 0·6; bill to gape 0·9.

Female. Wing 5·3 to 5·6 inches; tail 3·0; tarsus 1·5.

Iris light hazel; bill, upper mandible dark brown, its edge and the lower mandible flesh-colour; legs and feet dull red; soles greyish, claws brown.

Crown and nape olive-brown; forehead rufous, passing with a paler hue over the eye in a broad supercilium; cheeks and throat concolorous with the eye-stripe; lores whitish; chin and a stripe passing round the rufous gorget white; the latter edged with black across the throat; ear-coverts dark chestnut; general colour of the hind neck, back, rump, and upper tail-coverts greyish brown, crossed with buff dark-margined bands, the grey portions patched with chestnut on the interscapulary region and back, but not on the upper tail-coverts; the scapulars and wing-coverts are marked in much the same way as the back, but the rufous-chestnut colour almost entirely overcomes the grey except near the tips of the feathers, and the white bars run along the shaft and are more conspicuously edged with black; primaries and secondaries pale grey-brown, the secondaries and primary-coverts barred with buff, and the primaries with an external margin of the same near the base; tail deep chestnut, with a pale tip and a subterminal patch of black, the two centre feathers greyish brown, crossed with wavy mottled

bands of buff; beneath whitish, washed with rufescent on the chest, each feather crossed with from four to six narrow wavy bars of black, which on the centre of the chest take a crescentic course, and on the flanks become broader; on the upper flanks and sides of the breast there is a chestnut patch along the margins of many of the feathers; under tail-coverts rufous-buff, with narrow wavy bars of black; under wing rufescent white, barred with pale brown.

Females appear to have the bars of the under surface more crescentic than males; but I do not know whether this character is constant, as I did not examine a sufficient number of this sex. The chestnut side-patches are almost absent in immature birds.

Obs. The few examples in the national collection which I have been able to compare with my series from Ceylon are from the north of India, and present some slight points of difference to insular birds. The cross rays of the under surface are not crescentic, as they are on the centre of the breast in Ceylon specimens, but are in the form of *transverse* bars; and in a Kattiawar example there are scarcely any markings on the under tail-coverts, which are almost uniform rufous, with just a trace of barring on the shorter feathers; there is likewise less of the red coloration on the scapulars and wing-coverts. This is, however, a variable character in our insular birds, and is probably the same in continental. Three examples measure 5·4, 5·5, and 5·6 inches in the wing; tarsus 1·6. If my memory serves me aright, caged specimens brought from Tuticorin to Colombo for sale were identical with island birds; and I have no doubt that the species is one which is subject to slight variation in the matter of the marking of the under surface. Some examples I have seen from India have the under tail-coverts quite as much marked as in Ceylonese.

Distribution.—The Grey Partridge is confined to the extreme north of Ceylon and the north-west coast as far south as Puttalam. It extends down the coast as far as Battutoya; but about Chilaw I did not meet with it, and found from inquiry that it did not inhabit that district. It is very numerous on some of the islands off Jaffna, and likewise to the south of Pooneryn Point. In this neighbourhood there is a place called Kowtheri-munoi (Partridge Point), where Mr. W. Murray tells me as many as twenty braee have been shot in the morning before breakfast. All down the coast from this locality to Pomp-aripu it is more or less abundant, and in the Erinativoe Islands I found it plentiful. In Manaar Island it is the same, and beyond our limits in Ramisserum it is equally common. At Aripu Mr. Holdsworth states that it was always very abundant. Mr. Parker informs me that it is very abundant on the coast-plains to the north of Puttalam.

From time to time while in Colombo I met with it in the cinnamon-gardens, in which locality they always frequented one particular spot. These birds, I imagine, had been turned loose, as numbers of Partridges are brought in cages about February from Cochin, Tuticorin, and other South-Indian ports. In 1870 I observed a single bird which frequented some bushes beneath the north front of the Fort at Galle; but this individual had evidently escaped or been turned loose, as I never saw or heard of another in the south of Ceylon.

I am not aware how far south of Elephant Pass this Partridge ranges on the east coast; but I believe it has been met with to the north of Mullaitivu. It does not extend inland in any part of the island.

It is found, according to Jerdon, throughout the greater part of India, not frequenting mountainous or forest districts, and totally wanting throughout the Malabar coast. Though recorded from Nepal by Hodgson, it is rarely met with, says the author of the 'Birds of India,' north of the Ganges; but I imagine it is found on the plains of Oude and other level districts, eschewing, as Mr. Hume remarks ('Nests and Eggs'), the humid tracts of Lower Bengal, and the Dhoons and Terais that skirt the bases of the Himalayas. Mr. Ball records it from the Rajmehal hills, Manbhum, Hazaribagh, and Lohardugga, and remarks that it is rare in the extreme west of Chota Nagpur; he likewise found it in the higher valleys of the Suliman Hills. Thence northwards it probably extends into Afghanistan, as it ranges as far as Persia, throughout the south-eastern portion of which country Mr. Blanford found it. Its extreme western limit, writes Major St. John, in Persia appears to be Lar. It is also common in Baluchistan.

Returning, however, to the Indian Empire, with which we have more particularly to deal, we find it common in open and cultivated districts throughout the entire north-western region, although, according to Captain Butler, it occurs sparingly in the hills. Further south in the Deccan it is, according to the Rev. Dr. Fairbank, universally distributed, and is likewise said to be common by Messrs. Davidson and Wender. In the eastern

portions of the Carnatic it is, of course, common, and extends up to the bases of the mountain-ranges, if we may judge by Dr. Fairbank finding it at Peria Kulam at an elevation of 900 feet.

Habits.—In Ceylon this Partridge confines itself to the sea-coast, and there almost entirely affects open ground studded with low bushes and clumps of stunted jungle. Its habit is to frequent the vicinity of cover, and when alarmed to either run or fly into the nearest bushes and underwood, often perching on a branch at no little height from the ground. It is extremely noisy, commencing its loud call at daybreak and invariably renewing it, after its midday interim, about 4 o'clock. While cruising off or sailing down the north-west coast, the traveller may hear its far-sounding notes along the whole shore-line, continued until dusk. These resemble the syllables *ke-āugh-ke-āugh* repeated several times, and are varied by a more lively call like *ka-tēē klar-ka, ka-tēē klar-ka*, which may be heard at a long distance off. Mr. Simpson tells me that the male and female unite their notes and cry in consort. In the Jaffna district numbers of these Partridges are caught by the natives with hair nooses and kept for sale; many likewise find their way in native vessels to Colombo from Tuticorin, as many as half a dozen being confined in a small circular basket without any apparent inconvenience to themselves. Small covies associate together, but do not seem to keep close company, as when they take flight they are usually flushed singly and the birds get up at some little distance from one another. They prefer, however, to seek safety by using their legs, and are very swift runners; when they take to cover, they are sometimes difficult to flush, moving away entirely without the sportsman's knowledge, especially if he be unaccompanied by a dog. Jerdon testifies to the difficulty of flushing them, and says that they run with amazing speed, taking refuge in thick bushes and hedges. He writes as follows:—"When flushed it rises with a loud whirr, flies very strongly, but does not take long flights. It frequently perches on low trees and shrubs and on the branches of thick *Euphorbia*-hedges. Its call is a peculiar loud shrieking, and has not unaptly been compared to the words *patula-patula-patula*, quickly repeated, but preceded by a single note uttered two or three times, each time with a higher intonation, till it gets, as it were, the key-note of its call."

A writer in the 'Bengal Sporting Review' says that the young, which soon get strong on the wing, "attempt to call when only five days old."

I have found its food to consist of ants and grass-seeds; and Jerdon says that it is very partial to small grasshoppers.

Concerning its nature this writer remarks as follows:—"It is easily tamed, and may be brought to follow its owner about like a dog, even through a crowded street. It is very commonly kept by Mussulmans in small cages, sometimes for fighting, as it is highly pugnacious and fights with great spirit and obstinacy. Partridges with double spurs are esteemed the most for fighting. It will readily utter its call when spoken to, and is generally liberated on a grass plain for a run every morning, returning to its cage when called upon. It is also used as a decoy for wild birds, a tame bird being put down near an aviary and made to call, when he is invariably met by a cock-bird and a battle ensues. The bird-catcher approaches and seizes the wild bird as it is heedlessly engaged in the fight."

Several authors testify to its partial aboreal habits. Mr. Holdsworth noticed that it roosted in low bushes at Aripu; and Mr. Ball has known it to perch on trees at 20 feet above the ground and call from that elevated position.

Nidification.—Layard observes that this Partridge breeds twice a year, in August and December, laying from eight to sixteen eggs, measuring 15 lines (1·26 inch) by 12 lines (1·0); they are laid, he says, in a hollow at the bottom of a bush or tuft of grass, with little or no nest. The breeding-season, however, is continued later than December, for I have met with a young brood in the middle of March. Two eggs received by me from the Puttalam district were pale buff or very light stone-yellow, one having a few very faded lilac-coloured blotches at the small end. They are pyriform in shape, and measure 1·4 and 1·38 inch in length by 1·03 and 1·04 inch in breadth respectively.

In India it lays from February to June and from September to November, in all of which months Mr. Hume remarks that he has taken its eggs. "The nest is usually placed," writes this gentleman, "on the ground, under some large clod in a ploughed field, under a bush, or in a tuft of grass, but is sometimes fixed

in the lower branches of some dense thorny shrub as much as 3 feet from the ground." It is more or less neatly lined with grass, and the usual number of eggs varies from six to eight.

It is well known how close Partridges will sit on their eggs; and the "Grey" of India does not seem to be any exception to this rule. Mr. A. Anderson has the following anecdote relative to this habit:—"When out coursing on the *chur* lands opposite the station of Futtehgurh I flushed a 'Grey' which was feeding in an open field! It struck me at once that this was the male, and that the female must be feeding somewhere, because these birds invariably go in pairs, and this was their breeding-season. Forming a line with my coolies I beat every conceivable bit of cover (there was not a crop standing for miles), including a few clumps of *sarpat* grass which grew in the form of a hedge. I rode alongside of this grass hedge (it had been charred) and looking down into the centre of each clump soon discovered what at first appeared to be a hare in her *form*, but which on closer inspection proved to be the hen Partridge. The grass was again well beaten, and, as a last resort, handfuls of earth and small stones were showered in on her from above, but without avail. Seeing how futile were all my efforts to flush the Partridge, I decided on capturing her in her nest, which was effected by my horse-clothing being placed over the clump and the coolies making a rattling noise round the bottom of the grass, which eventually had the effect of making her rise perpendicularly. The nest was carefully fenced in with grass-stalks of the thickness of an ordinary cane, so that ingress and egress for so big a bird must have been a matter of no little difficulty."

Genus PERDICULA.

Bill short, very high at the base, the culmen curved from the forehead. Wings short and rounded, the primaries sinuated on the outer webs; the 3rd and 4th quills the longest; the 1st quill slightly variable in length; secondaries exceeding the primaries. Tail short, of 12 feathers. Tarsus stout, covered before and behind with broad scales, and armed with a blunt tubercle. Toes long, the lateral ones nearly equal.

Of small size. Sexes differing in plumage. Feathers of the chest rigid.

PERDICULA ASIATICA.

(THE JUNGLE BUSH-QUAIL.)

Perdix asiaticus, Latham, Ind. Orn. ii. p. 649 (1790).

Coturnix pentah, Sykes, Trans. Zool. Soc. ii. p. 19, pl. iii. (1835).

Perdicula cambayensis (Lath.), Jerdon, B. of Ind. iii. p. 581 (1864); Blyth, Ibis, 1867, p. 160; Beavan, Ibis, 1868, p. 386; Ball, Str. Feath. 1874, p. 427; Hume, Nests and Eggs, iii. p. 546 (1875); Fairbank, Str. Feath. 1876, p. 262.

Perdicula argoondah (Sykes), Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 107.

Perdicula asiatica, Gould, B. of Asia, pt. 15, pls. xii., xiii. (1863); Holdsw. P. Z. S. 1872, p. 470; Davidson and Wender, Str. Feath. 1878, vii. p. 87; Hume, *t. c.* p. 158; Ball, *t. c.* p. 225.

Perdrix rousse-gorge, Temm. Pl. Col. 447; *Spurred Quail* in India. *Juhar*, *Auriconnai* (Beavan) in Manbhum; *Girza*, Hind.; *Girza-pitta*, Telugu (Jerdon).

Adult male and female. Length 6·5 to 6·7 inches; wing 3·0 to 3·25; tail 1·3 to 1·5; tarsus 1·0 to 1·1; middle toe and claw 0·95 to 1·05; bill to gape 0·5, height at nostril 0·25.

Iris brownish red or dark red-brown; bill dark horn; lower mandible bluish, with dusky tip; legs and feet dark yellow-red; claws tipped with dusky.

Top of the head dark brown, paling on the occiput, hind neck, and upper surface into cinereous brown, and bounded by a conspicuous white stripe passing from the bill over to the nape; between this stripe and the eye a supercilium, below the eye a short stripe, and the chin and throat dark rufous; hind neck and upper back with buff mesial lines, and crossed with heavy pencillings of black; lower back and rump crossed with black-edged wavy buff barrings; scapulars, tertials, and wing-coverts marked with bold fulvous-yellow mesial stripes and the inner webs with large black patches and rufescent crossings; quills brown, barred with yellowish rufescent, chiefly on the outer webs; tail crossed with narrow alternate wavy bars of rufescent yellow and black; cheeks white, with black edgings; lower fore neck, chest, and sides of breast white, with bold black bars, blending into pale rufous on the lower flanks, abdomen, and under tail-coverts, the centre of the breast being rufescent whitish.

Female. Iris paler red than that of the male; bill somewhat paler; legs and feet yellowish red.

Rufous supercilium larger than the male, continued upon the forehead and back to the end of the white stripe; throat more intense rufous, this colour frequently joining the rufous spot beneath the eye; striæ on the hind neck faint; mesial stripes on the scapulars, tertials, and wing-coverts less bold and handsome, but the black and rufous-yellow markings similar; fore neck and its sides and entire under surface *uniform rufescent isabelline*, paling down the centre of the breast, and pervaded with a greyish hue on the chest.

Young. Iris pale brown; bill reddish brown at the base, becoming duskier at the tip; legs and feet pale yellowish.

In nestling plumage the *male* has the upper surface much as in the adult, but the stripes on the back much broader; the head-feathers edged pale; the white stripe above the eyes very broad; the red supercilium, cheeks, and throat wanting; the whole under surface is cinereous rufescent, brightest on the flanks and under tail-coverts, and the feathers of the throat, fore neck, and chest with white mesial lines, which extend partly down the flanks as well: on the chest there are indications of black bars; a slight wash of rufous on the chin: the cheeks whitish, striated with dark brown. At a further stage the rufous on the chin and throat increases slightly, and the fore neck and chest begin to assume dark bars, edged with rufous; these increase in intensity with age, and are found mingled with the still-remaining rufous feathers on the chest, the flanks being at this time very faintly barred.

Obs. The stripes on the back of the male evidently decrease with age; but it does not follow that the youngest birds have them the most pronounced; for a specimen before me with scarcely any rufous on the chin or trace of barring on the chest is marked with narrower striæ, both on the back and scapulars, than another, considerably more advanced, on the chest and throat.

I am again at a disadvantage in having no South-Indian specimens for comparison with my Ceylonese series. Judging from results obtained by comparing North-Indian and insular birds, I should say that the latter almost constituted a darker race, the only specimen that I have seen approaching them as to depth of colouring being a male labelled Behar in the British Museum. It measures 3·2 inches in the wing, and is nearly as dark above as my Eastern-Province skins; but there is more rufous on the forehead; the throat is as dark as the latter, but the thighs and under tail-coverts are darker ferruginous. A male from Futtehgurh, collected by Mr. Anderson, is altogether a paler bird, for, in addition to the back being a pale grey-brown without a trace of mesial stripes, the rufous eye-stripe and throat, and the barring of the chest, together with the black scapular-patches and the central stripes, are very much lighter in colour; and the bars, which are much closer than in my skins, are continued down to the belly instead of the lower breast, beneath which part the Ceylon bird is only marked with transverse pencillings. The same rufous feature on the forehead is observable that I have noticed in the Behar skin; and this is caused by the eye-stripe being much broader at its commencement near the nostril, and thus uniting across the forehead. Captain Beavan gives the measurements of specimens shot at Morar as follows:—Length 6·0 to 6·5 inches; wing 3·0 to 3·12; tail 1·5 to 1·75; tarsus 0·87 to 0·93; bill from gape 0·5.

I have not had the advantage of seeing any females from the continent, and therefore cannot speak on any points of difference in their case.

Perdicula argoondah, the Rock Bush-Quail, is recognized by the front of the crown and forehead being rufous, by the feathers at the end of the rufous cap on the top of the head being tipped with black, and by the absence of stripes on the scapulars and back; there is a white stripe immediately over the eye and also above the red stripe, as in *P. asiatica*; the throat and face are pale sienna reddish. The upper surface is characterized by the *barring* of the feathers; but examples from various parts of India appear to vary in their markings. Two males from Futtehgurh are very handsomely clouded with black and rich buff on the back, scapulars, and tertials, which coloration on the hind neck takes the form of bars. Another from Ahmedabad has but little of the black marking, the ground-colour dappled grey and black, with whitish-buff bars on the hind neck and back; the fore neck and breast are white, closely barred with black, as in *P. asiatica*.

I have followed Messrs. Gray and Hume in applying Latham's name to the present species, and not to the Rock Bush-Quail, as did Jerdon. Latham's description, to which I have referred, appears to apply sufficiently well.

Distribution.—Layard first recorded the existence of what we may conclude was this species in Ceylon. He speaks of it in his notes as follows:—"I have only seen one pair of these elegant little Partridges; they were caught alive at Cotta, near Colombo. I have an egg, which can only belong to this bird, also found in the same locality." That the Jungle Bush-Quail should occur in the Western Province is a matter of surprise to the author, for it is a species which belongs to the dry districts of the island, and has never been heard of, to my knowledge, on the south-western side by any one, except on the occasion in question. It inhabits the grassy jungles in the Park country, and those of the Wegam and Medagam Patuwas, which constitute the extensive district lying along the base of the Madulsima ranges. I found it very numerous in the months of August and September between Kalōday and Bibile on the new Batticaloa road. I am not aware for certain how far it extends towards the Hambantota district, but I believe it is found not far from Yāla. I did not see it in the Wellaway Korale, nor in the neighbourhood of Kattregama. It is probably a bird of local distribution, confining itself to strips and tracts of country throughout the Eastern Province, whose grassy glades are combined with clumps of open forest, and not passing beyond barriers of heavy jungle; in support of which belief I may mention that it seems to be shut in by the belt of forest lying between Kalōday and the Maha-oya, to the eastward of which I saw no trace of it. It was not met with anywhere above 1000 feet elevation.

Jerdon writes:—"This pretty little Bush-Quail is extensively distributed throughout India, and is found at all levels, from the sea-coast up to nearly 5000 feet of elevation. In the south of India it is chiefly found in the more wooded districts in Malabar, Mysore, on the Eastern Ghâts, and on the various hill-ranges, being rare in the low Carnatic and bare land. Col. Sykes found it on the higher ranges of the Western Ghâts at 4000 feet, and it is found throughout Central India as far as the northern slopes of the Rajmehal, Monghyr, and Mirzapore hills. It is not generally found on the north bank of the Ganges; but Hodgson cites it as found in the sub-Himalayan zone." Mr. Hume enumerates the localities whence he has obtained it as "Simla, the Dhoon, Umballa, Mount Aboo, Anadra, at the foot of Aboo; Etawah, Mirzapore; Seoni, Central Provinces; Nursingpore, Raipur, valley of the Tapti, West Kandeish, Mahabaleshwar; Kelsi, Bankok, and other localities in the Southern Korkan; Madras and Pothanore." Captain Beavan records it as tolerably abundant in

Manbhum; and Mr. Ball has procured it in other parts of Chota Nagpur and in the Satpura hills. It is found at Khandala and Mahabaleshwar, according to the Rev. Dr. Fairbank; and by Messrs. Davidson and Wender it is recorded as common in the hills at Satara and Nulwar.

Habits.—The Jungle Bush-Quail associates in moderately-sized covies, and affects grassy tracts and glades in the midst of forest; it keeps usually to long grass, where it obtains suitable cover, but in search of food will come out in roads and pathways; and while thus feeding I found that it exhibited a remarkably fearless disposition. During a trip to the Eastern Provinces in 1875 I first met with it, and at the outset became acquainted with it by finding small covies scratching by the road-sides after heavy showers of rain; they were searching for grain among the straw and litter left by natives at their nightly camps: on several occasions they took flight in little detachments of two or three; and when these were fired at their companions did not rise, but either ran into the adjoining grass or continued on the road. Such extraordinary tameness on the part of game-birds I had never previously witnessed; and when I even fired (with a view of getting as many specimens as possible) into a covey they did not rise, but quietly ran to the side of the road. Elsewhere I found them on the sandy bed of a dried-up river, similarly occupied in picking up the grain at a native camping-place. Their flight is straight and strong, but not long continued, for, when they appear to be "well on the wing," they suddenly drop to earth, after the manner of other Quails. While flying they gave vent to a chirping note, which was answered by those which were still on the ground.

Jerdon thus speaks of this Quail:—"Riding through some of the more open forests, especially in the upland districts, a bevy of this little bird is often seen crossing the road, or feeding on grain dropped by cattle. In the North-west Provinces, however, they appear to frequent gardens, bushes, and hedgerows in more open ground near stations. . . . . It is found in covies or bevies of from six to eight to a dozen and more; and generally all rise at once with a loud whirring noise, uttering loud cries of alarm, and after a short flight drop down again into the jungle." Blyth notices that it has a peculiar quivering whistle, which it utters continuously.

Nidification.—Immature birds procured by me in the Eastern Province in September appeared to be about five or six months old, so that the breeding-season is probably about March or April. The egg which Layard alludes to measured 12 lines (1·0 inch) by 9 lines (0·76 inch).

Concerning its breeding in India, we gather the following from Mr. Hume's 'Nests and Eggs.' He writes:—"The Rock Bush-Quail, the only species whose eggs I have myself taken, lays at any time from August to December, and again in March, and, for all I know, may lay straight on all the year through, but I have myself taken nests in all the months mentioned. I think they have two broods in the year, but cannot be certain; anyhow, March and September are the months in which I have found most eggs.

"They always prefer semi-waste strips of land covered with high grass, and in the neighbourhood of cultivation, for nesting. The nest is slight, composed of grass loosely wound round into a circular shape, and is placed generally, but not always, in a depression, scratched for it by the birds, at the foot of some tuft of grass or under some thick bush. Six or seven is the usual number of eggs laid."

The eggs are described as moderately broad ovals, somewhat pointed towards the small end; they are "white, glossy, and spotless, tinged (but far less deeply than in the Grey Partridge) with *café-au-lait* colour." Average dimensions 1·02 by 0·84 inch.

Genus COTURNIX.

Bill slender, slightly curved from the base; the naral membrane partly feathered. Wings longer than in *Perdicula*; the 1st and 2nd quill, or the 2nd, the longest. Tail lax, very short, concealed entirely by the coverts. Legs and feet moderately stout; the outer toe joined by a web at the base to the middle.

COTURNIX CHINENSIS*.

(THE CHINESE QUAIL.)

Coturnix philippensis, Brisson, Orn. i. p. 454, pl. 25. fig. 1.

Tetrao chinensis, Linn. Syst. Nat. i. p. 277. no. 19 (1766), *ex* Edwards.

Tetrao manillensis, Gmel. ed. Syst. Nat. i. p. 764 (1788), ♀.

Coturnix excalfactoria, Temm. Pig. et Gall. iii. pp. 515, 742 (1815).

Coturnix flavipes, Blyth, J. A. S. B. 1842, xi. p. 808, ♀.

Synoicus? *chinensis*, Gould, B. of Austr. vol. v. p. 92 (1848).

Coturnix chinensis, Blyth, Cat. B. Mus. A. S. B. p. 255 (1849); Layard & Kelaart, Cat. B. Appendix, Prodromus, p. 60 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 107; Sclater, P. Z. S. 1863, p. 221.

Excalfactoria chinensis, Jerdon, B. of Ind. iii. p. 591 (1864); Gould, B. of Asia, pt. 17 (1867); Beavan, Ibis, 1868, p. 386; Swinh. P. Z. S. 1871, p. 401; Holdsw. P. Z. S. 1872, p. 470; Ball, Str. Feath. 1874, p. 428; Legge, Ibis, 1874, p. 26; Salvadori, Ucc. di Born. p. 311 (1874); Walden, Tr. Zool. Soc. 1875, p. 224; Hume, Nests and Eggs, iii. p. 553 (1875); Oates, Str. Feath. 1875, p. 345; Hume, ibid. 1878, vii. p. 226, et 1879 (List Malay B.), p. 69; id. *t. c.* (List Ind. B.) p. 111.

Excalfactoria australis, Gould, Handb. B. of Austr. ii. p. 197 (1865).

Excalfactoria sinensis, Hume, Str. Feath. 1878 (B. of Tenass.), p. 447.

Chinese Quail, Edwards, Illust. v. p. 77, pl. 247, ♂; *La Caille des Philippines*, Brisson; *Blue-breasted Quail, Painted Quail, Rain-Quail, Swamp-Quail*, of Sportsmen. *Pikau*, Malay; *Chaun-chan*, China; *Pipit-kan*, Borneo (Mottley).

Pandura-watuwa, Wenella-watuwa, Sinhalese.

Adult male. Length 5·2 to 5·7 inches; wing 2·5 to 2·9; tail 0·9; tarsus 0·8 to 0·9; middle toe and claw 0·8 to 0·85; bill to gape 0·45.

Iris crimson or deep red; bill blackish leaden, bluish at the base, in some with the culmen only bluish; legs and feet rich yellow; claws olive-brown.

Old bird (Galle). Crown, hind neck, back, and scapulars olive-brown, with a bluish cast on the back, and tinged with rusty in parts, chiefly on the occiput, interscapulary region, and back; on the occiput and nape the feathers have

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* This species has been placed by Bonaparte in a separate genus, *Excalfactoria*, based on the difference of plumage in the sexes and the slightly rounder wing. The latter is a variable character as regards some of the species restricted to *Coturnix*. The bill, legs, and feet in the present bird are those of a true Quail, and I therefore do not adopt Bonaparte's genus.

small marginal spots of black; on the interscapulary region are bars of the same chiefly confined to a web, and on the lower back and scapulars there are bold blotches and markings of a like colour, with a whitish-buff mesial stripe to each feather, vanishing by degrees towards the hind neck; on the occiput there is an indication of a light streak formed by the pale colour of the basal parts of the feathers; quills, lesser wing-coverts, and primary-coverts uniform brown; tertials mottled with black at the tips; median and greater wing-coverts, with the outer webs and the margins of the inner, ferruginous chestnut: the centre of the feathers washed with slate-blue; upper tail-coverts (which entirely conceal the tail) slate-blue in the centre, and deep ferruginous chestnut at the sides; some of the central feathers mottled with black.

Chin, throat, and part of the cheeks black, enclosing a white pear-shaped patch on the face; below the black gorget there is a wide crescentic band of white across the throat, running up to, and narrowing to a point at, the ear-coverts: this is bounded beneath by a black border; through the lores a white stripe; forehead, passing over the eye and down the sides of the neck, chest, sides of breast, and upper flanks fine slate-blue, like the centre of the upper tail-coverts; centre of the chest, breast, abdomen, under tail-coverts, and tail deep ferruginous chestnut or fine chestnut-maroon; concealed feathers down the centre of the breast whitish; under wing-coverts pale greyish.

Another example, equally old apparently, from Borella, has the white stripes on the lower back more indistinct, and those on the upper part of the interscapulary region plainer; the latter part is more marked with black, as are also the tertials; there is much less chestnut on the chest, the blue colour monopolizing most of that part and descending much upon the flanks.

Immature males have the stripe on the occiput plainly indicated; the hind neck, back, and rump boldly striated with white, no bluish tinge on the back, and less of the chestnut-maroon on the wing-coverts; in some the latter characteristic is almost wanting.

Female. Smaller. Length 5·0 to 5·2 inches; wing 2·6 to 2·8.

Iris yellowish red, in some dusky red; bill dark leaden; legs and feet paler yellow than in the male.

COTURNIX COMMUNIS.

(THE COMMON QUAIL.)

Coturnix communis, Bonnaterre, Tab. Encycl. Méth. p. 217 (1790); Blyth, Cat. B. Mus. A. S. B. p. 254 (1849); Jerdon, B. of Ind. iii. p. 586 (1864); Hume, Nests and Eggs, iii. p. 549 (1875); id. Str. Feath. 1879 (List B. of Ind.), p. 111; Dresser, B. of Eur. pt. 69, 70 (1878).

Batter, *Ghagas batter*, Hind.; *Peria kadeh*, Tamil (Jerdon); *Budinah*, *Watwalek*, in Turkestan (Scully); *Summin*, Moorish; *Codorniz*, Spanish (Irby); *Kwartel*, Dutch.

Adult male and female (England). Length 7·50 inches; wing 4·2; tail 1·4; tarsus 1·1; middle toe 0·9; bill to gape 0·61.

Iris yellowish brown; bill dark brown; legs fleshy yellow.

Male (summer). General colour of the upper surface rusty brown; the feathers of the crown, hind neck, back, rump, and tail marked with black, mostly on the crown and rump; on the crown the feathers are tipped with fulvous, and on the hind neck, back, and tail centred with very broad rufescent-buff stripes, and the black lateral portions pencilled with rufous, which rather predominates on the interscapulary region; throat, upper fore neck, a broad eye-stripe, and another narrower one over the crown buffy white; cheeks and ear-coverts dark brown, mottled with rufous, and from the latter two curved stripes descend towards the centre of the throat, the lower passing across it in a band of a darker colour; wing-coverts and quills brown, the coverts striped and barred with buff, and the quills indented on the outer webs with the same; beneath fulvous, tinged strongly with rufous on the chest and upper breast; the flank-feathers with broad lateral black stripes, edged with rufous; chin spotted with brown; sides of the chest striped with blackish brown.

Plumage wanting the blue and maroon colours. General character of the upper surface ferruginous brown, handsomely blotched on the back and rump with black, and also cross-rayed with the same; the crown is chiefly black, the feathers edged with rufous-brown; down the centre is a conspicuous whitish stripe, tinged with rufescent in some, and the feathers of the upper surface, together with those of the scapulars, some of the tertials, and innermost greater wing-coverts, have a bold pale central stripe, most conspicuous on the rump.

Forehead, above the eye, face, chin, and throat *pale* rufous-brown, with a black-dotted stripe from the gape to the ear-coverts, which are greyish; chest, upper breast, and flanks barred with black on a light rufescent ground, which pales to whitish, unmarked on the lower breast and abdomen; thighs and under tail-coverts barred with black.

Birds which are apparently immature are characterized by the rufescent character of the striæ and ground-colour of the under surface. In some the chin is almost white.

Obs. I regret to say that I did not succeed in procuring any nestlings of this species; and I am therefore unable to supply those details as to young plumage and subsequent changes which I find wanting in previous descriptions of this interesting and variable little bird. It is, I think, not unreasonable to conjecture that the male and female are alike in the first stage.

An examination of a series from India, China, the Philippines, the Malay Archipelago, and Australia will demonstrate that this Quail *is* subject to much *local* variation, chiefly consisting in the greater or less amount of blue on the wings and back of the male, as also in the extent to which the black markings of the back monopolize that part, which latter characteristic must be looked for chiefly in the male. The absence or not of the occipital stripe, and the amount of striation on the back and of red on the wing, I take to be caused by age as much in birds from other parts as I have found to be the case in Ceylon, with this reservation, that in India the stripe on the head seems to be normally more pronounced than in birds from other parts. Birds which I take to be not fully-aged males from China ("Takow" and "China") agree, however, with some from India in having the stripe much pronounced.

Sarawak, Malaccan, and South-Australian examples (males) are characterized by a large amount of blue on the upper surface, and the females by having the lower back much overspread with black, and seem, at first sight, to be quite different birds; but on closer examination the coloration is merely an exaggeration of what exists in our birds.

Female. Wing 4·3 to 4·4 inches. Has the chest less tinged with rufous than the male, and the stripes on the side of the neck and the throat-band absent; the former are present as a series of spots only.

Young. The chick is rufous-buff above, with two broad black stripes over the head and one down the back, and an irregular stripe along the back at each side; wings striped with black.

Distribution.—Mr. Bligh, my valued correspondent from the Central Province, writes to me of the supposed occurrence, in the Yāla district, of the Common Quail. In January (1879) last he met with a pair of large Quails which were flushed from beneath his feet, and flew away strongly, uttering a chirping note similar to that of the species in question; but being in pursuit of large game at the time, he was unfortunately (for science at least) unable to fire, and he does not therefore consider his identification satisfactory. In point of fact these birds may have been the little Quail-Partridge, *Perdicula asiatica*, already treated of, or they may have been the Rain-Quail of India, *C. coromandelica*, which was included, on what authority we know not, in Kelaart's catalogue. The former is common in the Eastern Province, and the latter may have, on equal grounds with the Common Quail, journeyed southwards to Ceylon during the migratory season. Both are, however, only slightly smaller than the Bush-Quail (*Turnix taigoor*), which Mr. Bligh well knows, and numbers of which he met with on the trip in question about Yāla; whereas he writes me that these new birds were much in excess of that species. It is therefore not unlikely that, after all, his surmise may be correct, and doubtless on some future occasion the Common Quail will be satisfactorily identified from Ceylon.

It is a cold-weather visitant to India, being found throughout the empire in suitable localities during the winter months; but many pairs are said to remain to breed in the northern parts of the country. It does not appear to pass to the east of the Bay of Bengal, although it is an inhabitant of China in winter and summer, and a resident, according to Swinhoe, in Formosa. To these eastern regions of the continent, however, it finds its way from Southern Siberia, across which it extends in summer from Western Asia, reaching even the distant islands of Japan. In elevated regions on the

Mr. Gould separated the Australian species in his 'Handbook' as distinct, bestowing on it the title of *Excalfactoria australis*, on the ground of it being smaller. I do not find this to be the case, and as regards plumage it is not separable from Malayan-archipelago skins. The following are measurements of various examples:— ♂ (S. Australia), wing 2·7 inches; ♂ (Ceylon), wing 2·7; ♂'s (China), wing 2·7 and 2·9; ♂ (Sarawak), wing 2·9; ♂ (Penang), wing 2·7; ♀ (Ceylon), wing 2·6; ♀ (Nepal), wing 2·8; ♀ (South Australia), wing 2·6. It will be seen from these data that there is not that difference in size which would warrant a specific separation.

Females from China appear to have the under surface more rufous than Ceylonese.

C. minima, Gould, from Celebes, is, as its name implies, a very diminutive variety of the present. It differs also as regards plumage.

Distribution.—This beautiful species is found chiefly in the well-watered low-country districts of the west of the island, ranging into the hills to some considerable elevation, where it affects the paddy-fields cultivated on the terraced sides of the Kandyan valleys. It is a permanent resident in the cinnamon-gardens near Colombo, inhabiting the "water"-grass-fields and the damp fern-covered hollows near the watercourses which here and there intersect that once extensive plantation. In the south of Ceylon I have found them tolerably frequent in paddy-fields and grass cultivation near Galle, where Layard, as well as at Matara, observed it to be common. He likewise saw it in the Pasdun Korale. In the valley of Dumbara it is not uncommon, and I have known it to occur in paddy-fields high up in Hewahette (3500 feet). It is found about the borders of some of the tanks in the northern half of the island, affecting the grass-lands which surround these sheets of water. I noticed it particularly near Minery, and I have no doubt it frequents many such situations.

On the mainland its distribution is easterly. It does not inhabit the north-western parts of India at all, but ranges through Bengal into Assam and Burmah, and thence southwards down the Malay peninsula, and eastwards to China. Jerdon writes:—"I have killed it only in the Carnatic; one specimen is recorded in my Catalogue from Belgaum in Western India. It occurs occasionally in Central India, and in the upper provinces as far as Bareilly; but it is rare in all these localities, and perhaps only stragglers find their way so far. In Lower Bengal it is tolerably abundant in damp grassy meadows, the edges of indigo-fields, and in the grass on the roadsides; and in Burmah it was, in the month of July, the only Quail I observed." Following up these remarks I find that it has not been met with by recent naturalists in the Deccan, and that little is said in 'Stray Feathers' about its occurrence anywhere in India. Mr. Ball remarks that it occurs rarely in Chota Nagpur; and Mr. Hume records it from Raipur only as regards that part of India. In the British Museum there is a specimen from Nepal. On the eastern side of the Bay of Bengal it becomes

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northern confines of India it is resident; for, according to Dr. Scully, it is a permanent inhabitant of the plains of Kasgharia, and in these regions it has been obtained by Dr. Henderson as high as 13,500 feet at the Karatag lake. In the northern and south-western districts of Turkestan, Severtzoff states that it is resident up to 1000 feet. In Persia, writes Mr. Blanford, it is common in the summer, leaving there for India in the cold season.

It is an inhabitant of all Europe as far north as Archangel, and is tolerably common in Great Britain, extending in the breeding-season to the north of Scotland and also of Ireland. Throughout the continent of Africa it ranges as far as the extreme south, extending into Madagascar, whence Professor Newton has received it, and it has been obtained even in the island of Mauritius. It is, however, principally a winter bird in Africa, migrating, according to Captain Shelley, through Egypt on its way to Europe in March, and returning again in November. Layard states that they arrive in South Africa in August, some making their appearance as early as the 15th. The Atlantic islands are also included by this wandering little bird in its travels; for it is found in Madeira and the Canary Islands, and likewise in the Cape de Verdes and Azores.

Habits.—Concerning the Quail's habits in India (with which I merely have to do in such a curt notice as this) we read in Jerdon that it is there "found in long grass, corn-fields, stubble, and fields of pulse, wandering about according as the crops ripen in different parts of the country. . . . In parts of Bengal they abound to such an extent that seventy-

commoner. Mr. Oates writes of it:—"The Blue-breasted Quail is common in many parts of the Pegu plains. I first met with it in June, and throughout the rains it continues to be common. I am inclined to think that it comes to Lower Pegu at the beginning of the rains, and leaves as soon as the business of breeding is over." In Tenasserim it is sparingly distributed throughout the province according to Mr. Hume. In the Malay Peninsula, further south than Tenasserim, and connecting this province with the Malay islands, it must needs be found; and in Mr. Hume's List of Birds of that region it is recorded from Malacca and Nealys. It is likewise found in Penang, whence I have seen a specimen sent by Dr. Cantor. From Sumatra it was recorded by Raffles, and from Java by Horsfield; and in Borneo it has been obtained in Banjermassing by Mottley, in Sarawak by Mr. H. Everett, and in Labuan by Governer Ussher. Northward it extends to the Philippines, from which islands it was first made known, and where it is common in Negros; and thence it ranges to Formosa, and on the mainland it inhabits South China, being also found in the island of Hainan.

What islands form the connecting link between Java and Borneo and Australia I am unable to say; but this little Quail is evidently found on some of their intervening chain, and thus extends into the great island continent. There it is found, according to Gould, in "nearly every locality. In some seasons," he writes, "it is very numerous in such low and humid districts as are clothed with dense and luxuriant grasses and other vegetable productions." It is not uncommon in South Australia, and I have seen it myself in Victoria not far from Melbourne.

Habits.—This little bird loves damp spots, and thus frequents low-lying grassy hollows in open jungle, paddy- and watergrass-fields, moist fern-brakes, &c. It associates in small covies, and is not difficult to flush, though when on the wing it does not fly far. Its flight is straight but not strong, and it takes but little hitting to bring it down. In the south of Ceylon, where it is more numerous than elsewhere, it affords fair shooting, particularly in uncultivated paddy-lands, where it is sure to be found among rank herbage.

In the cinnamon-gardens of Colombo, where it is not uncommon, it affects the fields of water-grass grown in the damp hollows by natives for horse food; and in the evening I used to find it feeding in the stubble on portions which had been cut: when flushed it would fly off into the tall standing grass and was difficult to find again without a dog; I am under the impression, however, that they do not run like many game-birds, but lie very close after alighting, refusing to rise unless almost trodden upon. It is, as a rule, most silent, but occasionally it will utter a low *cheep, cheep,* when put up; and this I noticed particularly in the case of a bird which I appeared to have wounded with "dust" shot on first firing at it.

It thrives in confinement, like other Quail, but requires a roomy aviary to dwell in. Jerdon says little concerning its habits; but he remarks that when the young are full-grown they disperse all over the

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five brace have been killed by two guns." The same writer remarks that they are netted in great numbers in some parts of the country, and many are also caught in hair nooses. The Nepalese have an ingenious way of catching Quail. They put a pair of imitation horns on their heads and walk slowly about the stubble-fields, twisting some blades of grass in their hands in a way to imitate the champing of grass by cattle; and as these birds are not alarmed by cattle, they succeed in driving any Quail they see under a small net, which they then drop and secure the bird. Its note during the breeding-season is likened by Col. Irby to the syllables *quit que-twit.*

Nidification.—In India the Quail that remain to breed lay in March and April. Mr. Hume describes a nest which he found in the Purneah district as "a shallow saucer-like depression scratched by the bird and lined with a few blades of dry grass. It was placed in a tuft of grass and dwarf *Zizyphus* on a ridge separating two millet-fields. The nest contained nine eggs absolutely in the act of hatching off; we caught," he writes "the female on the nest, examined the eggs, found the point of the bills protruding in two, so put them gently back and put the mother on the top, where she sat winking at us, but never attempted to leave the nest."

The eggs, which are broad pointed ovals, are "clear yellowish or reddish buff, and they are thickly speckled and freckled, or more thinly spotted or blotched, with deep reddish brown, or at times bluish black. The average of nine eggs is 1·16 by 0·91 inch."

country; and this dispersion is greatly assisted, and in many parts perhaps caused, by the heavy inundations to which a great part of the country of Bengal is annually subjected. Mr. Mottley thus describes its habits in Borneo. "After having been once flushed," he remarks, "these Quails fly a short distance and are difficult to raise again, running with great rapidity among the grass."

Nidification.—In the Colombo district the Chinese Quail breeds in May, in which month I shot a specimen with an egg in the oviduct almost ready for expulsion; it was of a clear pale green colour devoid of any markings, although it might perhaps have acquired colouring-matter afterwards. I am unable to give any reliable information concerning the nesting of this bird, as but little is known about either its nest or eggs, and the data which do exist supply rather conflicting evidence. Jerdon describes the eggs as pale green; and this bears out my own experience. Mr. Hume furnishes but scanty information in his useful work 'Nests and Eggs,' referring only to a single egg which he received from Captain Hutton, and which is described as a "broad oval in shape, much compressed and pointed towards the small end, and with a slight pyriform tendency. The ground-colour is dingy greenish white, thinly speckled here and there with reddish brown. Dimensions 1·0 by 0·78 inch."

Again, my correspondent Mr. MacVicar, of the Ceylon Public Works Department, informs me of a nest, which he considers he satisfactorily identified, situated on the bund or embankment at the edge of a paddy-field near Kæsbawa; it was made of grass and built in a hollow in the ground. The number of eggs was seven, and in shape they were rather broad ovals, of a clear olive-colour, stippled throughout with dull brownish specks. The dimensions of one I measured were 1·0 by 0·96 inch.

Finally we have a note of an egg supposed to belong to this species in Lord Walden and Mr. Edgar Layard's paper on the birds of Negros ('Ibis,' 1872, p. 106), and which is as follows:—"A single egg of a Quail we suppose to belong to this species. Mr. L. Layard describes the bird as not uncommon. The egg is of a darkish brown generally, but irregularly speckled and blotched with very dark madder-brown specks and blotches of various sizes: axis 12 lines (1·0 inch); diameter 9 lines (0·76)." It will be observed that the size in the various accounts is about the same; and this goes far to prove that the eggs have severally been correctly identified, although they vary in colour. It is probable that Jerdon was misinformed as to the exact character of the egg, and thus omitted mention of any markings; whilst in the case of the one I extracted from a specimen the coloration was not yet complete.

GALLINÆ.

Fam. TINAMIDÆ.

Bill longer than in the last family, straight at the base, compressed at the tip; nostrils linear. Wings short. Tail very short, wanting in some genera; upper tail-coverts lengthened, concealing the tail in many. Tarsus moderately lengthened, without spurs. Hind toe usually wanting, in some very small.

Sternum with a deep emargination next to the keel, and the outer notch wanting.

Genus TURNIX.

Bill rather long, compressed, straight at the base, the tip well curved; gonys-angle pronounced. Wings moderate; the quills curved, the 1st, 2nd, and 3rd quills the longest. Tail very short, lax, of 10 or 12 feathers. Tarsus lengthened, much exceeding the middle toe, protected in front with rectangular scales; hind toe wanting; middle toe much longer than the lateral ones; claws stout.

Female in some species larger than the male and more handsomely coloured.

TURNIX TAIGOOR.

(THE BLACK-BREASTED BUSTARD-QUAIL.)

Hemipodius taigoor, Sykes, Cat. B. Dukhun, P. Z. S. 1832, p. 155 (the male); id. Trans. Zool. Soc. ii. p. 23, pl. iv. (1841).

Hemipodius pugnax, Sykes, *ut suprà*, p. 155 (the female).

Turnix ocellatus (Scop.), Blyth, Cat. B. Mus. A. S. B. (rufous var. from South India and Ceylon), p. 256 (1849).

Turnix sykesi, A. Smith.—I once met with a flock or bevy of small Quail among the long grass in tolerably open jungle near Kottiar, but did not procure a specimen. It is possible they may have been the above species; but, on the other hand, there is a small Button-Quail of India (*Turnix sykesi*) with which they may have been identical. I therefore subjoin Jerdon's description of this bird :—"Head brown, black-barred, with a pale supercilium and central stripe; upper parts chestnut-brown, each feather finely barred with black and edged with yellowish white, conspicuously on the scapulars and part of the back, and on the wing-coverts so broadly as to appear entirely yellowish white, with chestnut black-edged spots; quills dusky brown; rump and upper tail-coverts dark brown, closely barred with black, and with faint whitish edges to the feathers; throat whitish, with open blackish specks on the sides; breast pale ferruginous, with the sides of the neck and breast with dark brown drops and lunules; abdomen whitish; bill plumbeous; irides pale yellow; legs fleshy whitish. Length 5 to $5\frac{1}{4}$ inches, wing $2\frac{3}{4}$, tarsus $\frac{3}{4}$. . . . .

"Occurs throughout the whole of India (not, however, affecting hilly or forest districts) in grass, corn-fields, and wherever there is thick herbage. It is flushed with great difficulty, often getting up at your very feet, flies but a few yards, and drops down again into grass, not to be reflushed but after a most laborious search, and sometimes allowing itself to be caught by the hand or by a dog."

? *Coturnix coromandelica*, Kelaart, Prodromus, Cat. p. 131 (1851, nec Gmelin).

Turnix ocellatus (Scop., var. *taigoor*, Sykes), *apud* Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 107.

Turnix taigoor (Sykes), Jerdon, B. of Ind. iii. p. 595 (1864); Blyth, Ibis, 1867, p. 161 (in part); Beavan, Ibis, 1868, p. 386; Holdsw. P. Z. S.. 1872, p. 470; Ball, Str. Feath. 1874, p. 428; Legge, Ibis, 1874, p. 26, et 1875, p. 400; Butler & Hume, Str. Feath. 1876, p. 7; Fairbank, *t. c.* p. 62; Butler, ibid. 1877, p. 231; Davidson & Wender, ibid. 1878, vii. p. 87; Ball, *t. c.* p. 226; Hume, ibid. 1879 (List Ind. B.), p. 111.

Turnix pugnax, Hume, Nests and Eggs, iii. p. 553 (1875); id. Str. Feath. 1875, p. 178; Fairbank, ibid. 1877, p. 409.

? *The Indian Quail*, Kelaart; *The Button-Quail*, *Bush-Quail*, *Black Quail*, of Sportsmen. *Gulu* and *Gundlu*, Hind. in the south; *Salui gundru*, Hind. in N.W. Provinces; *Puredi*, lit. "the bold one" (female); *Koladu*, lit. "no spirit" (male), Telugu; *Kurung-kadeh* (female), *An-kadeh* (male), Tamil (Jerdon); *Kādai*, Ceylonese Tamils.

Watuwa, *Panduru-watuwa*, *Bola-watuwa*, Sinhalese.

Adult male. Length 5·8 to 6·0 inches; wing 3·0 to 3·1; tail 0·8 to 1·0; tarsus 0·95; middle toe and claw 0·8; bill to gape 0·67.

Iris white; bill light leaden, dusky brown on culmen; legs and feet pale bluish or fleshy grey, with the joints and tarsus washed with bluish.

Head and upper surface rufous, with a brownish wash on the former; the feathers of the crown with whitish tips, those on the hind neck with white bars, edged with black; back, scapulars, and tertials with wavy cross bars and pencillings of black, many of the back-feathers and the scapulars with broad lateral white stripes; wing-coverts with broad buff-white bands and bars of black; quills brown, the outer primaries with yellowish-white edges, and the secondaries with indentations of the same on the outer webs; throat, fore neck, and chest white, more or less tinged with buff, narrowly barred on the chin and throat and broadly barred on the chest with black; breast, belly, and under tail-coverts light rufous, palest on the abdomen.

Female. Length 6·3 to 6·5 inches; wing 3·4 to 3·55; tarsus 1·0; middle toe and claw 0·82; bill to gape 0·7.

Iris white, in some with a yellowish hue.

Head browner than in the male, with black spots and bars anterior to the white tips; back more handsomely barred with black, and with the longitudinal buff stripes bolder; wing-coverts and outer webs of the tertials with more of the buff-white ground, and very boldly barred with black; secondaries blackish brown except at the tips, which are pale; tertials rufous, marked with black and buff on the outer webs; chin, throat, and down the centre of the fore neck and chest *uniform black*; sides of the chest with broader black bars than the male; lower parts deeper rufous.

Young. Birds of the year are not so conspicuously marked as adults; the females have the throat barred with black, and the males indistinctly marked with the same; abdomen and under tail-coverts pale rufescent.

Obs. As on the mainland, so in Ceylon this species is subject to considerable variation in plumage. Specimens from the south and from the damp portions of the west of the island have the rufous of the underparts much deeper than north-country birds, which latter correspond tolerably with examples from India. Two skins in the national collection from India have the abdomen and under tail-coverts pale yellowish ferruginous, and the middle of the breast *fulvescent*; and these, I apprehend (for I have not had the advantage of looking over a large series), represent the extreme pale coloration in this species. They measure in the wing 3·3 and 3·4 inches, and are both females.

Two species are at present recognized in India as belonging to this type of Bustard-Quail—the present and the allied Malaccan, Burmese, and Himalayan form, *T. plumbipes*, Hodgson, *apud* Hume. This latter is, in fact, the species styled by Jerdon "The Hill Bustard-Quail," which he places under the head of *T. ocellatus*, Scopoli, and which follows his article on the present species in the 'Birds of India.' They are closely allied, and, according to Mr. Hume,

do not differ materially in size, nor can be separated safely on the ground of difference in *marking*. He writes, however (Str. Feath. vol. vi. p. 451), that "in *T. plumbipes* the prevailing tint of the interscapulary region and back is brown; in *T. taigoor* the prevailing tint of these parts is rufous, and this difference extends more or less to the head and the whole of the upper plumage." The rufous tints of the under surface are subject to the same variation.

The oldest title applied to the Black-breasted Bustard-Quail was that of Temminck, *T. pugnax*, Pl. Col.; but the species he described was said by him to inhabit Java, and may have been *T. plumbipes*, the eastern ally of *T. taigoor*. As Sykes, therefore, properly discriminated the peninsular Indian form under the last-named title, it has been adopted by recent ornithologists as more definite than Temminck's original name.

Distribution.—This Bustard-Quail is scattered over most of the open country in Ceylon, being more numerous in some localities than in others. In the maritime districts of the Western Province, including the sea-board from Manaar southwards to Chilaw, and in suitable localities round the south-west coast, it is perhaps more common than elsewhere. Again, in portions of the Eastern Province where the ground is sandy and covered with low bushes it is numerous, as in the Yāla district, where, Mr. Bligh writes me, it was abundant; and in the northern parts of the low country it is found in old clearings overgrown with grass and shrubs, and also on open bushy land on the borders of tanks. Mr. Holdsworth remarks on its occurrence at Aripu; and northward of that place along the coast to the Jaffna peninsula (in which latter district Layard says that it is abundant) it is also found. In the neighbourhood of Trincomalie I met with it frequently in grassy places near village tanks and in jungle-clearings. It is common in the cinnamon-gardens of Negombo, Colombo, and Morotuwa, and breeds even in public resorts, such as the "Circular," &c., where there are bushes to afford it the necessary cover.

To what elevation it ranges into the Kandyan zone I am unable to say; but I have not myself met with it in any high-lying patnas. It is, I believe, found on the Dumbara upland.

On the mainland it inhabits suitable localities throughout the peninsula of India, extending westwards to Cutch, where Dr. Stoliczka procured it, and in the opposite direction as far as Eastern Bengal, in which district its Malayan ally, *T. plumbipes*, replaces it; but beyond which, in Cachar and in the upper portions of Burmah, according to Mr. Hume, it is again found, though not as commonly as the latter species. In the Manbhum division of Chota Nagpur it was procured by Captain Beavan; and Mr. Ball records it besides from Lohardugga, Bilaspur, Nowagarh, and Karial, while Mr. Hume notes it from Raipur. In the Deccan it is said to be sparingly scattered throughout; and by the Rev. Dr. Fairbank it is recorded as common in the Khandala district; he likewise observed it in grain-fields near the base of the Palani hills. As regards the north-west, Captain Butler remarks that it is not common and does not ascend the Aboo hills; and Mr. Hume observes that he has not heard of it from Sindh, Jodhpoor, or Kattiawar.

Habits.—The Black-breasted Bustard-Quail is an inhabitant of open scrub, long grass dotted with bushes, the outskirts of low jungle, cinnamon-plantations, and such-like situations where cover is combined with grass and rank vegetation. It is rarely found in damp spots like the last species, and, in fact, is especially partial to sandy soil, which is the driest ground to be had anywhere in the maritime regions of Ceylon. It is only when accompanied by their young brood that these birds are found in coveys; they are generally met with singly, or two at some little distance from each other; they lie close, and when they rise either fly straight back over your shoulder, or dart like an arrow round the nearest bush, suddenly alighting again when out of reach of danger. At times they are very difficult to flush without a dog, as the bird runs in and out among bushes, and dodges backwards and forwards and in and out among the grass and shrubs, most of the time visible to the sportsman, who is eagerly waiting for it to rise. Some of the Bustard-Quails, and particularly the present species, are remarkable for the Amazonian disposition of the females, which, being larger and more handsomely plumaged than their partners, exhibit, during the breeding-season particularly, the bold and combative propensities which usually characterize the males. The hen birds attract each other by uttering their note, which Jerdon aptly styles a "purring call;" and when a *rencontre* takes place they at once engage in combat. So intent are they in carrying on the battle that I have stopped my carriage within a few yards of a pair fighting by the roadside in the "cinnamon," and watched them for some time without their taking any notice of me!

Jerdon has the following paragraph on the habits of the females and the advantage taken of them by the native bird-catchers. He writes:—"The hen birds are most pugnacious, especially about the breeding-season; and this propensity is made use of, in the south of India, to effect their capture. For this purpose a small cage with a decoy-bird is used, having a concealed spring-compartment, made to fall by the snapping of a thread placed between the bars of the cage. It is set on the ground in some thick cover, carefully protected. The decoy-bird begins her loud purring call, which can be heard a long way off; and any females within ear-shot run rapidly to the spot, and commence fighting with the cage-bird, striking at the bars. This soon breaks the thread, the spring-cover falls, ringing a small bell at the same time, by which the owner, who remains concealed near at hand, is warned of a capture, and he runs up, secures his prey, and sets the cage again in another locality. In this way I have known twelve to twenty birds occasionally captured in one day in a patch of thick bushy jungle in the Carnatic, where alone I have known this practice carried on. The birds that are caught in this way are all females, and in most cases are birds laying eggs at the time; for I have frequently known instances of some eight or ten of those captured so far advanced in the process as to lay their eggs in the bag in which they are carried before the bird-catcher had reached my house."

They fight like the common hen, stretching up their heads and trying to circumvent each other, pecking out vigorously all the while. When undisturbed they have a low "grunting" note, which they continue to utter while running about in cover. Their diet consists chiefly of seeds; but I have always found insects in the stomachs of specimens I have examined. The larvæ of grasshoppers is included by Jerdon among their food; and he rightly remarks that their flesh is excellent, being succulent and tasty. When "walking" up these Quail without a dog the females are usually flushed, and one rarely succeeds in putting up a male.

Nidification.—In the south of Ceylon, as well as in the north-west, this Quail lays from February till May, and most likely has another brood later in the year. The nest is placed in a depression scraped in the ground under the shelter of a tussock or bush, and is made of grass and dry leaves loosely put together, but forming rather a bulky structure, with a deep hollow in the middle. The eggs vary from two to four in number, and are very large, particularly as regards diameter, for the size of the bird. Some are much pointed at the small end, others are more in the shape of pointed ovals, but always very broad. The ground-colour is dull greyish white, thickly freckled all over with dark brown, over which there are largish spots of blackish scattered here and there; in others there are inky-grey blotches and large blotches of black, whilst in some the very dark markings are entirely wanting. They measure from 0·90 to 0·98 inch in length by from 0·69 to 0·75 inch in breadth.

I have found the male sitting on the eggs; and Captain Butler relates catching a male bird in a hair noose he set by a nest; so that the habit of the female to depute her partner to assist in the duties of incubation would appear general.

In India this species lays from June to September, according to locality, commencing earlier in the south than in the Carnatic. Mr. Hume remarks:—"Sometimes it makes no nest at all, and merely scratches a hollow at the base of, or in the midst of, some tuft of Sirpatta grass, or occasionally some little dense bush adjoining or surrounded by long grass. Sometimes it makes a little pad of grass 3 or at the most 4 inches in diameter and half an inch in thickness, which it places as a lining to the hollow." Jerdon tells us that the females are said by the natives of India to desert the eggs, and that the males hatch them. Judging by the details already referred to on this head, it would seem probable that this assertion is correct. Mr. Hume characterizes the stippling on the surface of the eggs as a "mixture of minute dots of yellowish and reddish brown and pale purple." The average size of thirty eggs, according to him, is 0·93 by 0·79 inch.

Order GRALLÆ.

Bill varied, but usually straight, in many long and slender. Wings proportionately long. Tail in general short, the feathers varying much in number. Legs lengthened and slender, with the *tibia bare* *; anterior toes often connected by a partial web, sometimes only between the middle and outer toe; hind toe in general small and raised, in a few long and on the same plane as the front; in some absent altogether.

Fam. RALLIDÆ.

Bill in general rather short (in some lengthened), much *compressed*, high at the base, straight, with the nostrils median and pierced through the mandible; culmen in many produced back upon the forehead in a casque. Wings rounded, with a tubercle at the flexure; the tertials lengthened. Tail of 10 to 12 feathers, very short, scarcely exceeding the closed wings. Legs more or less lengthened. Tarsus moderately stout, covered in front with broad transverse scales. Feet large. Toes lengthened, exceeding the tarsus in some; hind toe well developed, rather long in some.

Sternum narrow, the keel high, and with a very deep notch on each side of it.

Mostly of skulking and aquatic habits, and with the power of swimming well.

Genus PORZANA †.

Bill rather short, much compressed, straight, slightly depressed at the centre of the culmen; nostrils linear, and placed in a lengthened depression; gonys pronounced. Wings slightly rounded, the 3rd and 4th quills the longest, and the 1st shorter than the innermost; a small tubercle at the flexure. Tail longer than the tarsus, rounded, the feathers lax; bare portion of tibia less than the hind toe and claw. Tarsus equal to the middle toe, covered with broad but smooth scales. Toes smooth; outer toe longer than the inner; claws acute.

Of small size.

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* The Woodcock forms an exception.

† I commence the Grallæ with this genus of the Rallidæ, as it grades more than any other into the Quails, and exhibits slight affinities with the Gallinaceous birds. The pretty little subgenus *Coturnicops*, of which Mr. Swinhoe's little Chinese Crake (*C. exquisita*) is a member, have much the form and aspect of game-birds.

PORZANA BAILLONI.

(BAILLON'S CRAKE.)

Rallus bailloni, Vieill. Nouv. Dict. xxviii. p. 548 (1819).
Crex pygmæa, Naum. Vög. Deutsch. ix. p. 567, pl. 239 (1838).
Zapornia bailloni (Vieill.), Gould, B. of Europe, p. 344 (1837).
Porzana pygmæa (Naum.), Blyth, Cat. B. Mus. A. S. B. p. 284 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 267; Jerdon, B. of Ind. iii. p. 723 (1864); Schlegel, Mus. Pays-Bas, *Ralli*, p. 30 (1865); Swinhoe, P. Z. S. 1871, p. 414; Holdsw. P. Z. S. 1872, p. 476; Hume, Lahore to Yarkand, p. 293 (1873); Walden, Trans. Zool. Soc. ix. p. 230 (1875); Howard Irby, B. of Gibraltar, p. 143 (1875); Scully, Str. Feath. 1876, p. 193; Blanford, Str. Feath. 1877, p. 247.
Ortygometra pygmæa (Naum.), Gray, Gen. B. iii. p. 593; Gurney, Ibis, 1865, p. 273; Shelley, B. of Egypt, p. 275 (1872); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1236 (1874); Hume, Str. Feath. 1874, p. 301.
Zapornia pygmæa (Naum.), Hume, Nests and Eggs, iii. p. 603 (1875); Butler, Str. Feath. 1877, p. 215.
Porzana bailloni (Vieill.), Davison & Hume, Str. F. 1878 (B. of Ten.), p. 467; Ball, ibid. vii. p. 229; Dresser, B. Eur. pt. 65, 66 (1878); Hume, Str. F. 1879 (List B. Ind.), p. 113.
Pygmy Rail, *Pygmy Crake* of some authors. *Pollos de Agua*, Spanish (Saunders); *Polluela*, Spanish (Irby); *Himi-kuina*, Japanese (Blakiston and Pryer); *Tsing-tsuy*, lit. "Green bill," Chinese (Swinhoe).

Adult male and female. Length 7·0 to 7·4 inches; wing 3·5 to 3·8; tail 1·3 to 1·6; tarsus 1·1; middle toe 1·3; bill to gape 0·78 to 0·8.

These measurements are taken from a series of Ceylon, Chinese, Bornean, and European examples.

Dr. Scully gives the following measurements of a Yarkand example:—Length 7·3 inches; wing 3·6; tarsus 1·1; bill from gape 0·85.

Captain Shelley's measurements are:—Length 6·5 inches; wing 4·0; tarsus 1·1; culmen 0·7.

Iris red; bill, upper mandible dark green, lower paler; legs and feet olive-greenish, toes slightly dusky, claws brown. "Bill dull sap-green" (*Everett*, MS.). Bill brownish olive-green (Colombo, Dec. 1876).

Male (Bintulu, Borneo: winter). General colour of hind neck, back, wing-coverts, and tail yellowish olive-green, the feathers of the head, hind neck, back, and scapulars with black centres, and those of the back and scapulars with broad margins of white on one web, which is likewise mottled with black; on the wing-coverts and tertials there are oblique white bars surrounded by black edges; primaries and secondaries brown, edged with olive; a broad slate-coloured stripe above the eye; face grey, tinged with slaty; lores and a stripe above the eye and the sides of the neck rusty olivaceous; immediately in front of the eye a blackish spot; throat whitish, blending into the pale slaty of the fore neck and chest; sides of the breast rusty olive, changing to blackish on the lower flanks, abdomen, and under tail-coverts, all of which parts are barred with white; under wing-coverts brownish, barred with white; edge of 1st primary white.

An example procured in Ceylon in 1876 corresponds with the above; the chin and gorge are whitish, blending into the surrounding slaty bluish of the sides of the throat, chest, and upper breast.

These examples are probably not mature, owing to the white on the chin.

Adult (Holland). Throat, fore neck, and whole face with the ear-coverts slaty bluish; no white on the chin; lower parts blacker than in the above. A *Shanghai* example has the slaty colour of the neck and chest bluer than in the Bornean bird; the chin is whitish.

Young (nestling). "Covered with black down; bill white; feet reddish white." (*Dresser.*)

Immature. "Differs from the adult in lacking all trace of blue; the sides of the head are warm ochreous brown, the chin and upper throat pure white; lower throat, breast, and upper flanks dull brownish ochreous; centre of the abdomen white; flanks and under tail-coverts black, barred with white; upper parts as in the adult, but scarcely so clearly marked." (*Dresser.*)

Obs. Allied to this species is *P. parva*, Scop., which is found in parts of India (Sindh, &c.). It may be distinguished, writes Mr. Hume, by having the white markings on the upper surface, which are broader and of a somewhat purer white than in *bailloni*, "confined, as a rule, to the centre of the back, though occasionally some of the longer scapulars are faintly edged with bluish white."

The wing varies from 3·75 to 4·1 inches, and the bill at point from 0·7 to 0·76 inch, according to the same authority.

Distribution.—This little Crake has proved itself to be an occasional straggler to Ceylon, visiting the island in the cold season at the time when, in other parts of the world, it is acted upon by a migratory impulse and moves southwards.

Two instances of its occurrence are all that are known to me: the first was made known by Layard, who writes (*loc. cit.*), "a single specimen was brought to me alive from Kotte;" the second, which came under my personal notice, was that of an individual which was caught on the 22nd of December, 1876, in the compound of Mr. Haly, the Director of the Colombo Museum. It was evidently a new arrival, and the date of its discovery shows that it was a very late visitor of the season. It is highly probable that others came with it; and in future years examples will, no doubt, from time to time, fall into the hands of collectors.

Baillon's Crake enjoys a vast range, occurring throughout Europe, except in the extreme north, takes in the whole of Africa, more or less, into its wanderings, extending across to the island of Madagascar, spreads across Southern and Central Asia to the Philippines, and thence through the Malay islands to Australia.

It is found throughout India in suitable places, but it does not seem to be common in the south. The Rev. Dr. Fairbank records it from Ahmednagar; but Messrs. Davidson and Wender did not meet with it in the Deccan. Further north Mr. Ball notes it from Sambalpur on the north of the Mahanadi, from Nowagarh and Karial, and from the Rajmehal hills. Mr. Hume records it from Raipur, and notices that it is sometimes obtained near Calcutta and brought into the market for sale; he likewise notes it from Dacca and Tipperah.

Westward it is found at Etawah (breeding there), also near Delhi; and at Syree, near Simla, which has an altitude of about 4000 feet, it is common. In Cashmir it breeds, and is doubtless plentiful in suitable localities. In Sindh it appears to be very rare, being replaced there by *P. parva*, Scop.; but Mr. Blanford instances a specimen which was obtained at the Manchar Lake. Mr. Adam also records it once from the Sambhur district in Rajputana. I do not find it spoken of by Mr. Oates in Pegu; and in Tenasserim it appears to be rare, as Mr. Davison only saw it at Tavoy. Concerning its distribution in the Indo-Chinese region, we have not much data; it probably occurs in winter in Siam and Cochin China, and likewise perhaps in summer, for Swinhoe records it as inhabiting China throughout in the latter season. It extends northwards to Japan, but does not appear to be common there, Messrs. Blakiston and Pryer only instancing one example in their catalogue, which was procured at Yezo. It visits Borneo in the winter, Mr. Everett having obtained a specimen at Silai in the Bintulu district, which has been described above, and which, according to Mr. Sharpe, is the first that has ever been met with in that island. It appears to have occurred in the Philippines, as there is a specimen in the Leyden Museum procured there by M. Verreaux.

Returning to the confines of India, we find Severtzoff stating that it occurs on passage in Turkestan, and likewise breeds in the north-western and south-eastern districts at altitudes up to 3000 feet. At Yarkand Dr. Scully remarks that it is not at all common, but that probably some individuals breed there. In Palestine Canon Tristram met with it; and it is said to breed in the Caspian district. It visits the northern shores of the Mediterranean in April, later than which Dr. Giglioni notices that it arrives in the Pisa district. In Sardinia Mr. Brooke says that it is of rare occurrence; and in Hungary it is likewise uncommon. In the south of Spain it is chiefly a winter resident, as Col. Irby says it is very common from October till February, being met with while snipe-shooting. He also obtained it in May at the Laguna de Janda, and states that

many remain to breed in April. Lord Lilford found it nesting near Seville; and Mr. Saunders likewise states that it breeds in that neighbourhood, recording it also as common on the Siguera river. It extends into Central Europe, and ranges as far north as Great Britain and Holland. It has bred in Great Britain, two nests having been taken in Cambridgeshire in 1859; but it has, nevertheless, not extended to Ireland.

In Morocco and Eastern Tangier, Mr. Tyrwhitt Drake observes that Baillon's Crake is rare; and Mons. Favier, as cited by Col. Irby, makes a similar remark. As an Egyptian bird Captain Shelley gives it a place in his book solely on the evidence of Rüppell, who states also that it occurs in Arabia. Mr. Gurney, jun., obtained it at Laghouat in Algeria; and Von Heuglin met with it frequently in the Fayoom, generally in pairs and at the beginning of May, from which he infers that it probably breeds there. Hartlaub records it from Madagascar; and in South Africa it is far from rare. Mr. Ayres met with it in the Transvaal in January and April, and says it is common in Natal at Maritzburg; while in Damara Land, on the opposite coast, Mr. Andersson observed it frequently. Finally it has been recorded from Madeira.

Habits.—Like most of the smaller Rails, this little bird affects concealment to such an extent that it is difficult to flush it, unless it is suddenly frightened up while shooting Snipe or other Waders, or put on the wing by a dog. It frequents small sedgy watercourses, marshes, and overgrown swamps. Mr. Hume says that in India it may be "at times mistaken for a Quail. It is of much the same size, looks on the wing of much the same colour, and takes short flights over the rushes, and drops suddenly just like a Quail."

Mr. Davison writes that at Tavoy "a few frequented some canals overgrown with rank grass and wild pine-apple. They were very difficult to obtain, as it was almost impossible to flush them from the cover in which they lodged." Col. Irby also states that, owing to their skulking propensities, they are seldom obtained in Spain.

Von Heuglin noticed it principally frequenting tamarisk-scrub growing in shallow water; in the day-time it was shy, rising on his approach, and taking refuge among the roots of thick and tangled vegetation, from which it was difficult to drive it. In the mornings and evenings, however, it was to be seen moving about in more open places, and now and then giving vent to its piping cry. He found its diet to consist of worms, larvæ, flies, and small snails.

Mr. Ayres's experience of it is as follows:—"It inhabits the swamps and rushy pools, creeping amongst the weeds and grass on the edges in search of food; when disturbed it flies but a few yards, and drops suddenly into the weeds almost before the gun can be got to the shoulder, and is therefore not very easy to shoot. The morning is the best time to look for these birds."

Nidification.—The Pygmy Rail breeds in the plains of Upper India in July and August, and, according to Mr. Hume, in June and July in Kashmir and the valleys of the lower ranges of the Himalayas. A nest taken by Messrs. Brooks and Hume at Etawah "was of rush and weed in the midst of grass and wild rice, very little above the water's surface." It is often quite concealed by the surrounding grass. At Syree a similar nest to the above was found, containing six eggs, which appear to be the usual number.

The eggs are described as being oval, pointed towards one end; of a pale olive stone-colour, freckled and mottled with faint dusky clouds and streaks, most densely set towards the large end. They vary in length from 1·1 to 1·12 by from 0·83 to 0·91 inch in breadth. Col. Howard Irby writes that they make a small nest, in Spain, of sedges and grass placed at the edges of swamps, and that they lay from five to seven eggs, olive-brown, spotted with darker brown.

PORZANA FUSCA.

(THE RUDDY RAIL.)

Rallus fuscus, Linn. Syst. Nat. i. p. 262 (1766); Gmelin, ed. Syst. Nat. i. p. 713 (1788).

Gallinula rubiginosa, Temm. Pl. Col. 387 (1825).

Porzana fusca (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 285 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 267; Jerdon, B. of Ind. iii. p. 724 (1864); Blyth, Ibis, 1867, p. 171; Holdsw. P. Z. S. 1872, p. 476; Hume, Str. Feath. 1879, p. 113 (List Ind. Birds).

Ortygometra rubiginosa, Temm., Kelaart, Prodromus, Cat. p. 135 (1852).

Rallina fusca (Linn.), Schlegel, Mus. P.-B. *Ralli*, p. 20 (1864); Hume, Str. Feath. 1875, pp. 188, 500; id. Nests and Eggs, iii. p. 604 (1875); Salvadori, Ucc. di Born. p. 338 (1874); Hume, Str. Feath. 1878, vi. p. 467.

Limnobænus rubiginosus, Sund. Meth. Nat. Av. disp. Tentamen, p. 131 (1873).

Râle brun des Philippines, Buffon, Pl. Enl. 773; *Tiklin brun*, id. Hist. Nat.; *Brown Rail*, Latham.

Korowaka, Sinhalese; *Neer kuruvi*, Tamil (MacVicar).

Adult male and female (Ceylon). Length 7·9 inches; wing 3·5 to 3·7; tail 1·3; tarsus 1·3 to 1·45; middle toe 1·4, with its claw 1·7; hind toe and claw 0·6; bill to gape 0·8.

Iris orange-red, eyelids reddish; bill olive-brown; tibia, knees, and soles dull orange-reddish; tarsus and top of toes reddish brown (*September*).

Forehead, head above the eyes, face, ear-coverts, fore neck and its sides, chest and centre of upper breast dull vinous red, enclosing a white chin and gorge; rest of the head and all the upper surface with the flanks dark greenish olive, pervaded with a rusty hue on the rump, upper tail-coverts, and tertials; quills and tail olive-brown; lower breast and abdomen brownish, barred and tipped with white, the whole pervaded with a slight rusty hue; sides of rump and under tail-coverts darkish olive-brown, with wavy bars of white; under wing-coverts tipped with white.

Young. "These entirely want the rufous tint, and have the entire chin and throat white, and the rest of the lower surface dull olive-brown, mottled or imperfectly barred with brownish white. Towards the end of November they begin to assume the rufous tint, which in their case is ferruginous and lacks the rich vinaceous hue of the adult, which first appears on the lores, cheeks, and ear-coverts, and then spreads in spots on to the lower throat, breast, &c." (*Hume.*)

A bird of the year in Mr. Bligh's collection has the forehead and round the eye only red, the lower part of the cheeks being whitish, and the fore neck and chest greyish, with indistinct barrings of brown and reddish, showing most plainly on the sides of the neck; upper surface less olivaceous than in the adult. Wing 3·65 inches; tarsus 1·3.

Obs. Consequent on Jerdon's description of the legs of this species as green, there have been several remarks on the subject of late years in 'Stray Feathers.' Dr. Stoliczka and Messrs. Oates and Hume testify to their being red, the latter gentleman stating that they are brighter in the breeding-season than in winter. He describes the legs and feet as being "red at all seasons, shaded with dusky on the joints and toes." The amount of dusky colour no doubt varies in individuals, both in winter and summer. I carefully noted the colours in a September specimen, and the tibia were as brightly coloured, if not more so, than any other part. However there is ample proof that Jerdon's description is erroneous, probably due to an oversight in the preparation of his MS.

This species varies in size. My measurements are taken from three specimens only, and are smaller than those of Indian specimens as recorded in 'Stray Feathers.' Mr. Oates gives the dimensions respectively of a pair, male and female, as:—length 8·55, 7·8 inches; wing 3·8, 3·75; tail 1·75, 1·7; tarsus 1·4, 1·46; bill from gape 1·0, 0·98. Mr. Hume's measurements of four female examples from the Calcutta district are:—length 8·5–8·7; wing 3·8–4·2; tail 2·1–2·2; tarsus 1·4–1·55; middle toe and claw 1·6–1·75; bill from gape 0·91–1·0.

Porzana (Rallina) erythrothorax, Temm. & Schlegel, from Japan and China, is considered to be doubtfully distinct from the present. It is said by Swinhoe to have longer toes, and the pectoral red not extending down so far upon the belly; on the other hand, Schlegel (Mus. Pays-Bas, *Ralli*, p. 21), writing of Japanese specimens, says :—"Absolument semblable à la *Rallina fusca*, mais d'une taille plus forte, aile 4 pouces 1 ligne à 4 pouces 2 lignes.... doigt du milieu 14 lignes et demie à 16 lignes." These dimensions (4 inches 2 lines and 16 lines) for wing and middle toe do not, however, exceed Mr. Hume's of a female from Calcutta, viz. 4·2 and 1·75 inch (middle toe with claw). On the evidence of one Japanese example from the Swinhoe collection (Hakadodi, June) now before me, I am unable to look upon it in any other light but that of a somewhat larger or more robust local race of our bird—perhaps worthy of being called a subspecies of it. The distribution of colour, even to the slightly dusky wash on the lores, is absolutely the same; but the tint of the hind neck and upper back is slightly greener, and the red of the face and fore neck not quite so deep as in a Ceylon specimen. Its dimensions are :—wing 4·4 inches; tarsus 1·45; middle toe and claw 1·67; bill to gape 1·03. Its longer wing and stout bill are chiefly noticeable on a comparison with our bird.

Two other members of this genus found in India, and which *might* occur in Ceylon in the cool season, are :—

The Brown Rail, *P. akool*, Sykes. Brown above, with a white chin, and the breast and belly ashy brown; rump ashy brown: wing about 7 inches.

The Spotted Rail of Europe, *P. maruetta*, Leach, which is a cold-weather visitant to the empire. It has the upper surface olive-brown, marked with white, not unlike Baillon's Crake; but it has a pale eye-streak; the neck and breast are olivaceous, spotted with white, and the belly is white: wing $4\frac{1}{2}$ inches.

Porzana bicolor, Walden, is another species from the Himalayan districts. The wing measures 4·5 inches; and its prevailing colours are ashy grey on the throat, neck, breast, abdomen, flanks, and thigh-coverts, the tail and coverts being darker grey, and the hind neck, back, rump, shoulders, and scapulars ferruginous olive. It has been lately discovered near Darjiling, and was described by the late Marquis of Tweeddale in the 'Annals and Magazine of Natural History,' 1872, ix. p. 47.

Distribution.—This Small Rail is migratory to Ceylon, appearing in September and probably departing again about April. It visits the island in very limited numbers, or it would be more often met with; and I am under the impression that, like the next species, it betakes itself chiefly to the hills. Layard mentions having only seen three specimens, all from Kotte: the time of the year is not stated; but it may be concluded that they were taken about November, at which season the natives of that district generally bring in birds to Colombo for sale. Several specimens were met with by me in Uva in September 1875; and on one occasion I surprised a pair together near Lunugalla in Madulsima. Mr. Bligh has met with it in the low country at Wellaway; and I have heard of it being seen about the marshes and paddy-fields of the Fort-Macdonald district.

Jerdon remarks, concerning the distribution of this species, that it is found throughout India, not very common in the south, but more abundant in the north, especially in the well-watered province of Lower Bengal. Mr. Hume likewise observes that it is pretty plentiful in Lower Bengal; and thence to the north-west it probably extends sparingly through the country; at any rate Dr. Stoliczka found it breeding in Cashmir at the Woolar lake. In this direction it is very rare, as it is not recorded by Messrs. Hume, Butler, or Adam from Rajpootana, Sindh, or Guzerat. In the opposite direction towards the East its range is more extensive, though even there it is not common. Mr. Oates procured a pair at Boulay in Upper Pegu; but in Tenasserim Mr. Hume has not heard of it occurring, though Blyth says it is common in Burmah. It no doubt occurs in the Malay peninsula, for it is found in the Straits in the island of Singapore, having been procured there by Herr Müller. In Java it would appear to be not uncommon, for Professor Schlegel tabulates five specimens from that island as being in the museum at Leiden. It was procured in Borneo by Schwaner, and in the Philippines by Messrs. Verreaux and Cuming. I am unable to say, from want of data, whether it is found in Cochin China; but further north the Ruddy Rail, which inhabits the Chinese empire, is set down by Swinhoe in his catalogue to be the same (*P. erythrothorax*) as the Japanese race.

Habits.—This Crake does not always confine itself to the vicinity of water, although it is found on the borders of streams and damp sedgy spots. I have met with it in a wood at some distance from water, and when it was flushed it flew a short distance and perched in a low tree. Its flight is not swift, although the movement of its wings is rapid.

Jerdon observes that it frequents "thick swamps, marshes, and the like; and it appears from the following account by Mr. Oates to be quite at home amongst floating vegetation. Of the pair he procured in Pegu he writes as follows:—"I have watched these birds for a long time. Close to my house there is a nasty dirty swamp overrun with reeds. Just at its end, about fifty yards from my verandah, there is a small comparatively clear piece of water; upon this piece of water these two little birds were to be seen every morning walking about briskly over the lilies; but whenever I attempted to get near them they would stalk away in the grass."

Nidification.—This species breeds in Lower Bengal; and in Cashmir, as I have already observed, it has likewise been found nesting. Mr. Hume found it breeding in Lower and Eastern Bengal from July to September, "making a nest of weeds and grass, reeds, or rush, just like Baillon's Crake, and in precisely similar situations, but somewhat larger and more substantial." The number of eggs, according to this author, varies from 3 to 5; and they are moderately broad ovals, somewhat pointed at the small end, and the shell with little or no gloss. They are of a "pinky or creamy white, more or less streaked, spotted, and blotched with brownish red or reddish brown," with a number of pale inky-purple spots intermingled with the red markings at the large end. They vary from 1·16 to 1·27 inch in length by from 0·8 to 0·89 in breadth.

I have examined two eggs taken near Chilaw by the taxidermist of the Colombo Museum, and said to have been found in a nest "built on the ground at the edge of a paddy-field" (*MacVicar*). They somewhat resemble the eggs of this species, but are rather small, measuring only 1·08 by 0·86 inch and 1·12 by 0·83 inch; they are creamy white, spotted all over, but mostly at the large end, with reddish brown. It is very improbable that this race has bred in Ceylon; but it is difficult to assign these eggs to any other species.

Subgenus RALLINA.

Bill stouter than in the last, the wing more graduated, with the 4th quill the longest. Tail shorter, and the toes stouter, more scaled, and shorter than in *Porzana*; claws short. Plumage banded beneath.

RALLINA EURYZONOIDES.

(BROWN'S RAIL*.)

Gallinula eurizonoides, Lafresn. Rev. Zool. 1845, p. 368.

Porzana ceylonica, Blyth, Cat. B. Mus. A. S. B. p. 285 (1849, *nec* Gm.); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 267; Jerdon, B. of Ind. iii. p. 725 (1864); Hume, Str. Feath. 1873, p. 440, et 1875, p. 188; Bourdillon & Hume, ibid. 1876, p. 405; Hume, ibid. 1878, vii. p. 465.

Corethrura zeylanica (Brown), *apud* Kelaart, Prodromus, Cat. p. 135 (1852).

Porzana zeylanica, Blyth, Ibis, 1867. pp. 171, 309 (*nec* Gm.).

Rallina euryzonoides (Lafr.), Gray, Hand-l. B. iii. p. 58 (1871); Tweeddale, P. Z. S. 1877, p. 767; Hume, Str. Feath. 1879 (List Ind. Birds), p. 113.

Rallina ceylonica, Holdsw. P. Z. S. 1872, p. 476 (*nec* Gm.).

The Rail, Brown, Illustr. pl. 37; *The Ceylon Rail*, Kelaart, *l. c.*; *The Banded Rail*, Jerdon; *The Chestnut-headed Rail*, *The Ferruginous-breasted Rail*, of some. *Nordewind*, Dutch in Ceylon (Layard); *Neer kuruvi*, Tamils (MacVicar).

Adult male and female. Length 9·5 to 10·0 inches; wing 4·7 to 5·0; tail 2·2; tarsus 1·6 to 1·75; middle toe and claw 1·45 to 1·55; hind toe and claw 0·55; bill to gape 1·2 to 1·25.

Iris mottled closely on the exterior portion with red-brown on an olive ground (after death the red-brown intensifies and spreads over the iris); bill dark brown, sides of lower mandible green; legs and feet plumbeous or plumbeous brown.

Male. Head, upper part of hind neck, its sides, fore neck, and chest fine ferruginous chestnut, enclosing a white chin and throat of more or less extent; lower part of hind neck, upper surface, and wings uniform brownish olive, brown on the inner webs of the quills, which are barred at the margin, near the base, with white; wing-coverts faintly tinged with rusty brown; breast, lower parts, under tail-coverts, thighs, and under wing-coverts blackish brown, broadly banded with white, which overcomes the ground-colour on the abdomen, this part being, in some, almost white. Some specimens have the occiput tinged with brown.

Female. Has the hind neck, occiput, and hind part of the crown brown, like the back; the forehead and front of crown chestnut-red, the colour passing over the eye and covering the face and ear-coverts, whence it passes over the sides of the neck to the chest; the lores are shaded with brown; the extent of the white on the throat is, I think, as a rule, greater in this sex than in the other. The barring of the underparts presents no constant difference to that in the male.

Young (?). Birds which I conclude are immature have the face and ear-coverts olive-brown, tinged with chestnut-red, the sides of the neck brown, and only the forehead chestnut; the red of the chest is of small extent and is sullied with brown.

Obs. Mr. Hume has shown, in his remarks on this species in 'Stray Feathers,' that Blyth's species, *R. amauroptera*, "distinguished by having less rufous on the nape," is only the female of this bird. Blyth described his species from Northern-Indian specimens, and arrived at the conclusion that it constituted a race from that part of the country. Some examples of the present Rail are said to have the smaller scapulars banded with white, like the allied species *R. fasciata*, to be presently noticed; but I have seen no Ceylonese skins exhibiting the slightest trace of this character.

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* There are two other species of this little group, more banded than the present; I therefore discard the usual title "Banded Rail" and adopt the more suitable one, after its first describer, Brown.

The form inhabiting the Philippine Islands is somewhat darker in its chestnut or rufous coloration and has less white on the throat. An example from Manilla in the British Museum exhibits these characters, and has the rufous descending lower upon the breast and the black bands of the under surface broader than in Ceylonese and Indian skins. Its measurements are :—wing 5·3 inches ; tarsus 1·65 ; bill to gape 1·03. Three examples (2 ♂, 1 ♀) from Cebu and other Philippine localities, in Captain Wardlaw Ramsay's collection, and kindly lent me by that gentleman, correspond with the Museum skin ; they have the rufous of the head and hind neck very dark, and the chin is very pale rufescent or rufescent whitish ; the black on the breast, abdomen, under tail- and under wing-coverts preponderates over the white. The female has the red colour descending from the head upon the hind neck. The dimensions are :— ♂, wing 4·9–5·4 inches, tarsus 1·65–1·78, bill to gape 1·15 ; ♀, wing 5·4, tarsus 1·58, bill to gape 1·18. This Philippine race seems to me almost worthy of distinction as a subspecies, based upon its darker coloration and the fact of the female being similar to the male.

The Malaccan representative (*R. fasciata*, Raffles) of our bird differs in being smaller, and in having the wing-coverts and quills brown barred with white, the latter on both webs of course. The head, neck, and chest are dull rufous-chestnut, with the throat slightly paler ; the lower parts are very broadly banded with black ; the back and tail rufous-brown (Singapore, British Museum). Mr. Hume, in his exhaustive paper on the birds of Tenasserim, describes this species fully, and states that both sexes are alike. His measurements (5·0 to 5·3) for the wing of male examples are, however, in excess of what mine are for Ceylonese examples of *R. euryzonoides* ; and from this I infer that the latter species varies considerably in size, for Ceylonese migrants of this bird must be identical with those which pass through India.

A very closely allied species from China is *R. mandarina*, Swinhoe. A specimen before me is more olivaceous on the back than our bird ; it is a male, and the brown of the hind neck extends forward on the head to the bill, where it is tinged with the ferruginous hue of the face and chest ; the scapulars and wing-coverts are crossed sparingly with very white bands. The dimensions of this example are—wing 5·0 inches, tarsus 1·42, middle toe 1·42, bill to gape 1·08 ; the chin is whitish, and the white bands of the lower parts narrower than the black.

Rallina canningi, Tytler, from the Andamans, somewhat resembles our species, but is much larger, measuring from 6·3 to 6·5 inches in the wing. I have not personally examined this bird ; but it is described as being very handsome, with the " upper parts and breast of a rich dark colour, approaching to maroon ; a slight olivaceous tinge about the rump ; throat less deeply coloured ; the abdominal region, flanks, and plumes black, with from two to four transverse white bands on each feather " (*Blyth*).

The first description of this species, until recently, has always been ascribed to Gmelin, and his name *zeylanicus* (afterwards modified into *ceylonicus*) almost invariably assigned to it. The late Marquis of Tweeddale, however, pointed out (P. Z. S. 1877) that Gmelin did not found his description on Brown's figure " *The* Rail " (p. 94, pl. 37 of his 'Illustrations'), but upon another bird described by Brown as a " Rail " (p. 96, pl. 38). Gmelin quoted p. 96 when describing his *Rallus zeylanicus*, at the same time referring, in error, to the right drawing of this species in plate 37. This, however, is not considered as proof that he had Brown's *The* Rail in view, for his diagnosis does not apply to it. The next oldest title given to the bird is that of Lafresnaye, and it has therefore been adopted.

Distribution.—This interesting Rail arrives in Ceylon, appearing, so far as has been observed, chiefly on the west coast, at the end of October and the beginning of November. When the north or "longshore" wind sets in those who are acquainted with this bird at Colombo begin to look out for it, as it arrives on the coast in an exhausted state, and on coming to *terra firma* conceals itself in the first place which it can find, very generally choosing houses and hiding behind furniture, in thatched roofs, or even in wellington boots. I first heard of it from my friend Mr. Holdsworth, who found one in his bedroom at the Galle-face Hotel. Mr. Bligh afterwards informed me of several having been captured in the same building, which abuts on to the sea-beach, and affords the exhausted travellers a speedy but unsafe refuge. Some years greater numbers seem to arrive than others. In October 1876 several were caught at Colombo, one of which I found one morning early in the new buildings at the corner of Chatham and Queen's Streets ; and a day or two afterwards another was captured in my back yard at the new officers'-quarters, while a third was found in the Surveyor-General's office. It is only at this season that they are noticed on the coast, and a short time afterwards they have entirely disappeared and are not often to be found even in the low country of the interior. They take their departure for the hills and are not uncommon during the cooler months about Kandy, Deltota, Hewahette, and Maturata. Mr. Bligh has recently sent me an example which he procured on the summit of the Harangolla patnas, close to the Trigonometrical station ; he has likewise shot it in jungle above Catton estate, at an elevation of over 5000 feet ; and Mr. Thwaites tells me that it has been killed at

Nuwara Eliya. So far as I have been able to ascertain, it is seldom seen after February on the hills, and it leaves the island much more unobserved than it came. It does not seem to be common in the Galle district during the season of its arrival.

From the writings of Indian naturalists we are able to gather but little concerning either the distribution or the habits of the "Banded Rail." Jerdon compares its range to that of the last species; but it would appear to be a much rarer bird, and is probably migratory to the south. In this locality I see nothing recorded of its occurrence, save in a remark by Mr. Bourdillon concerning a specimen which was procured by a Mr. Ferguson at the foot of the Travancore hills. It would appear to be common in Upper India; but even in that region few naturalists seem to have observed it. In the North-west it is apparently unknown; and even from Mr. Ball's exhaustive list of the birds of the eastern district of the Peninsula it is wanting. Mr. Hume speaks of it as occurring at Cawnpore "and other places in Upper India;" but he does not seem to have noticed it, even rarely, in the Calcutta Bazaar, where in the cold season all the other Indian members of the family are occasionally to be met with. It occurs in Pegu. Mr. Oates records the capture of a specimen in the verandah of the Deputy Commissioner of Thayetmyo. In Tenasserim it is replaced by *R. fasciata*.

There is but little to record concerning the *habits* of this Rail besides its singular propensity, already noticed, for concealing itself in houses and buildings. Layard writes of it:—"I found one in the well of my carriage, another in the folds of the gig-apron, and a third in a shoe under my bed!" The individual which I discovered in the buildings, above alluded to, when I approached it ran slowly along by the walls and among the joists of the flooring, with its neck stretched out Rail-fashion, and did not appear very anxious to escape. It was evidently bewildered with the strange abode in which it found itself; and this, combined with physical exhaustion after its long flight, made it so indifferent to its fate that it was caught with no difficulty.

It would seem reasonable to infer that these Rails follow the mainland down to Cape Comorin and then fly across the Gulf of Manaar at night, aided by the northerly wind blowing at the time of their migration. Their Dutch name, it is needless to remark, is founded on this latter fact.

In the hills it frequents sedgy places near streams in the coffee-estates, and likewise the paddy-fields of the Kandyans; but it is not unfrequently found in dry places far removed from water, and into which it finds its way during its nocturnal wanderings.

Its breeding-haunts appear still to be undiscovered, and I am therefore unable to give any particulars concerning its *nidification*.

Genus HYPOTÆNIDIA.

Bill longer than in the last, more slender, but with the gonys pronounced; nasal depression produced in the form of a groove. Wings with the 3rd quill the longest; the secondaries more lengthened than in *Rallina*. Toes longer than in that genus, equal to the tarsus; hind toe proportionately shorter.

Plumage banded above.

HYPOTÆNIDIA STRIATA.

(THE BLUE-BREASTED RAIL.)

Rallus striatus, Linn. Syst. Nat. i. p. 262 (1766, *ex* Brisson); Gmelin, Syst. Nat. i. p. 714 (1788); Blyth, Cat. B. Mus. A. S. B. p. 285 (1849); Layard & Kelaart, Prodromus, Cat. B. App. p. 62 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 267; Jerdon, B. of Ind. iii. p. 726 (1864); Blyth, Ibis, 1867, p. 172; Holdsw. P. Z. S. 1872, p. 476.

Rallus gularis, Horsf. Trans. Linn. Soc. 1821, xiii. p. 196.

Hypotænidia striata (Linn.), Schl. Mus. Pays-B. *Ralli*, p. 24 (1865); Swinhoe, P. Z. S. 1871, p. 415; Salvadori, Ucc. di Born. p. 336 (1874); Walden, Tr. Z. S. ix. p. 232 (1875); Hume, Nests and Eggs, iii. p. 605 (1875); id. Str. Feath. 1875, p. 189; Armstrong, ibid. 1876, p. 349; Oates, ibid. 1877, p. 165; Ramsay, Ibis, 1877, p. 471; Davison, Str. Feath. 1878 (B. of Tenass.), p. 468; Hume, ibid. 1879, p. 70 (B. of Malay Penin.), et p. 113 (List Ind. Birds).

Tiklin rayé, Buffon; *The Striated Rail* of some. *Wade-kodi*, Telugu (Jerdon).

Korowaka, Sinhalese; *Burok-Burok-peai*, Borneo (Mottley).

Adult male and female. Length 10·0 to 11·5 inches; wing 4·6 to 4·7; tail 1·6; tarsus 1·55 to 1·65; mid toe and claw 1·8; bill to gape 1·6 to 1·75.

Iris red; bill—culmen dark brown, paling to slate at the tips, the sides of both mandibles red; legs and feet olivaceous or livid brown, with the joints darker; claws pale brown.

Dr. Armstrong records the iris of a Rangoon example as "light yellowish brown."

Male. Forehead, top of the head, nape, and hind neck ferruginous chestnut, the centres of the feathers dark; lower part of hind neck, back, wings, and tail brownish black, paling at the margins of the feathers to olive in some and rufescent olive in others, each feather crossed with wavy bars of white; quills blackish brown, barred with white; lores, face, fore neck and half its sides, chest, and upper breast slate-blue, enclosing a white chin and gorge; breast, belly, flanks, under tail-coverts, thighs, and under wing-coverts blackish brown (in some olive-brown), closely barred with wavy white bands, broadest on the flanks; under tail-coverts with deep buff-white tips and bars.

Female. The ferruginous chestnut-colour of the head does not descend so much upon the hind neck; otherwise the same.

The coloration of the upper surface is variable in my Ceylonese specimens, probably the result of age. Some are more olive than others, this colour occupying, in such cases, much more than the margin of the feathers. There is more white on the under tail-coverts in some specimens than in others.

Young. A presumed immature bird in the British Museum has the head and hind neck rufescent, the crown striped with black; chin and throat whitish; fore neck washed with rufescent; back and wings paler than in adults, but barred the same; flanks scantily barred with white; middle of the breast and abdomen whitish.

Obs. This species, judging from the observations of Indian observers, is subject to some variation in the colour of the soft parts and likewise in size; that is, if Jerdon's or Mr. Hume's measurements (Str. Feath. 1874, p. 302), which indicate a maximum of 5·25 and 5·2 inches respectively in the wing, be correct. I have not met with a Ceylonese specimen exceeding 4·7 inches. Professor Schlegel's dimensions, taken from a series from Java, China, Luzon, and Cochin China, are 4 inches 1 line to 4 inches 8 lines. A Bornean individual in the British Museum measures 4·5 inches, and a small series of Philippine, Indian, and Burman examples kindly lent me by Captain Wardlaw Ramsay vary from 4·5 to 4·8 inches. Philippine individuals are very dark, in fact almost inseparable from the Andaman race or subspecies *H. obscuriora*, Hume (*H. ferrea*, Walden), which I will presently notice; the black portions of the upper-surface feathers are much darker and extend over them, leaving the margins and terminal

portions only olive; the ferruginous colour of the head is darker than in Indian specimens, and is more extensively marked with black on the nape; the slaty colour of the breast is also purer in tint than in Indian birds. These examples are from the islands of Cebu and Leyte. A Javan specimen in the national collection has the head, back of neck, and upper surface as in Ceylonese birds; but the slate-colour of the fore neck descends further upon the breast; the amount of white on the throat is the same. A Rangoon example of Captain Wardlaw Ramsay's has the upper surface like that of my specimens, but the head and hind neck are darker in tint. A Banjermassing skin is almost identical with a Ceylonese, but the markings of the under tail-coverts are more buff. Malaccan skins are likewise very similar.

There is considerable variation in the bills, both as to length and proportionate thickness; but those of females, which are smaller birds, are constantly of less size than in the males.

The Andaman race (*H. obscuriora*) has been separated on account of its large size and darker colours. Mr. Hume gives the wing-measurement (Str. Feath. 1874, p. 302) as 5·4 to 5·5. Two examples in Captain Wardlaw Ramsay's collection from S. Andaman measure (♀) 5·2 inches, (♂) 5·5 in the wing, and 1·7, 1·8 in the bill from the gape. They are certainly much darker than Indian, Ceylonese, and Burman skins, but *scarcely* darker than a skin from Cebu; and the difference is owing simply to the black, which is a little more intense and spreads more over the feather. The ferruginous tints of the head and hind neck are certainly darker than in continental specimens; but the same is the case in the Philippine birds. It is at best a very closely allied race.

Gray includes 13 species of these short and stout-billed forms of *Rallus* in his 'Hand-list,' chiefly from Malaya and the Pacific islands.

H. pectoralis (Cuv.), from the Pacific islands and Australia, is somewhat similar to the present, but has more black on the head, a white supercilium, and there is a broad fulvous band (its chief characteristic) across the chest; the chest is very pale blue-grey, and the under surface is more boldly barred than in *H. striata*. A Samoan example measures 5·3 inches in the wing.

H. torquata is peculiar to the Philippines; and another species found there, *H. philippensis*, extends to Celebes, Australia, and New Zealand.

Distribution.—This handsome Rail is a rare bird in Ceylon, and is, I should say, very local in its habitat. Layard met with it at Pt. Pedro, where a living example was brought to him; he also received it from the Batticaloa district. I have myself only met with it in the neighbourhood of Negombo, where I found it frequenting the small scrub-covered islands at the head of the lake, and near the canal in the swamp of Mutturajawella. The taxidermist of the Colombo Museum, Mr. Hart, has, I believe, also met with it in the Western Province. I am inclined to think that it is migratory, as I have not seen it at any other season than during the north-east monsoon.

In the south of India, Mr. Davison procured it at Kotagherry, in the Nilghiris, but it does not appear to be common in the south. Jerdon, however, affirms that "it is found throughout India, from the extreme south to the Himalayas and the Punjab, especially in the cold weather. . . . . It is rare," he says, "in the Carnatic and Deccan." It is not recorded by either Messrs. Bourdillon, Fairbank, Ball, or Butler from any of the districts aforementioned in this work; and there is no reason, I think, to infer that it extends towards the north-west of the empire, as its distribution is manifestly easterly. In Lower Bengal it is not uncommon; and we find Mr. Hume recording it as being brought into the Calcutta market in the cool season. At Sylhet, in the north-east corner of the Presidency, Mr. Cripps found it common in May and June. Eastward of the bay it appears to be locally distributed, but perhaps, on the whole, more numerous than in India. In Upper Pegu Mr. Oates did not meet with it, but had a specimen sent to him which was shot near Prome; but in Lower Pegu it is common, he says. At Rangoon and Tonghoo Captain Wardlaw Ramsay likewise affirms it to be plentiful; but Dr. Armstrong only saw it in the vicinity of Syriam. Further south, in Tenasserim, Mr. Davison observes that it is sparingly diffused over the more level and open tracts of the central and northern portions of the province.

From the Malay region it has more than once been recorded; in the list of the birds of the western half of the peninsula we find it noted from "Malacca, Nealys, and Singapore." In Java it is probably not uncommon; Professor Schlegel records several examples from that island in the Leyden Museum. It was obtained there both by Horsfield and Boie. In Sumatra Raffles procured it; and in Borneo it has been obtained at Banjermassing by Mottley, and at Sarawak by Doria and Beccari. Everett shot it in Marup; and

further to the east it was obtained by Wallace in Celebes. In the Philippine Islands, from where it was first made known and described, it is found in Luzon.

From the Malay Peninsula it probably extends through Siam to Cochin China, where it was procured by Diard. It inhabits the island of Formosa; and from China Schlegel records it, though Swinhoe does not seem to have met with it on the mainland.

Habits.—I found the Blue-breasted Rail frequenting thick underwood near the margin of the water surrounding the small islands in the Negombo lake. This fine sheet of water, which is brackish, discharges into the sea a mile from these islands, and the water around them is quite salt. On one occasion I observed the birds feeding on the tidal mud at the edge of the water in the same manner as a Sandpiper, and they allowed me to approach within shot before running up the bank into the scrub. I met with them singly, but I saw two not far from each other. Their stomachs contained tiny mollusca and very small insects.

Although, as Jerdon says, it frequents marshes and grassy ground by the sides of tanks and rivers, I suspect that it affects jungle-cover rather than moist vegetation; for Mr. Davison observed that in Tenasserim it confined itself, as "elsewere, to cover in the vicinity of vegetation." Dr. Armstrong merely writes that he saw it in "marshy ground." Mr. Cripps, however, shot two which were walking about a piece of weed-covered water in Sylhet; and doubtless their choice of situation depends on local circumstances.

Nidification.—In Burmah the present species breeds from July till October. Captain Wardlaw Ramsay found it breeding at Tonghoo during the months of August and September; and Mr. Oates found its nest in July and as late as the 11th of October. The latter gentleman describes the nest as being a "mere pad of soft grass, leaves, and the outer rind of the elephant-grass, about 8 inches in diameter and 1 thick, placed in a tuft of grass, always near water, and raised a few inches above the ground. The coarse grass growing round paddy-fields is a favourite locality." He further says, "the bird sits very closely, and the nest is not easy to discover. The male bird sits on the eggs, at least at times; and I killed one with a stick while he was sitting on seven eggs." These vary in number from four to seven. "Some are," writes Mr. Oates, "almost glossless, others are considerably glossy. The ground-colour is pinkish stone, pale when fresh, and darkening as incubation proceeds. The shell-markings consist of blotches and splashes of pale purple, evenly but sparingly distributed over the egg; and the surface-marks consist of large blotches and streaks of rather bright rusty brown. These marks are larger at the thick end than elsewhere, and run chiefly in the direction of the longer axis of the egg. In some eggs the marks form a distinct cap and the shell-marks are very fine. The average size of 31 eggs is 1·34 by 1·00."

Mr. Hume observes that eggs sent him by Mr. Cripps from Sylhet, where the bird breeds in May and June, are of the regular Waterhen type, and the ground-colour varied from white to salmon-pink. The markings consisted of "spots, specks, streaks, and blotches of maroon-red, and smaller spots and streaks of dull inky purple or grey." Dimensions 1·33 to 1·36 by from 1·03 to 1·05 inch.

Genus RALLUS.

Bill long, slender, slightly curved; upper mandible deeply grooved; nostrils linear, placed close to the margin. Wings short, somewhat rounded, the 2nd and 3rd quills the longest, the 1st equal to the 7th. Tail short, cuneate. Legs rather short. Tibia bare for less than the length of the hind toe and claw. Tarsus shorter than the middle toe, covered in front with broad transverse scales; outer toe considerably longer than the inner; hind toe short.

Sternum exceedingly narrow, compressed near the centre almost to the keel, with a very deep and narrow notch in the hinder part.

RALLUS INDICUS.

(THE INDIAN WATER-RAIL.)

Rallus indicus, Blyth, J. A. S. B. 1849, xviii. p. 820; id. Cat. B. Mus. A. S. B. p. 286 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 267; Jerdon, B. of Ind. iii. p. 726 (1864); Swinhoe, P. Z. S. 1871, p. 415; Holdsw. P. Z. S. 1872, p. 476; Blyth, Ibis, 1873, p. 80; Swinhoe, Ibis, 1873, p. 363, et 1874, p. 163; Hume, Str. Feath. 1875, p. 416; Blakiston & Pryer, Ibis, 1878, p. 225; Hume, Str. Feath. 1879 (List B. of Ind.) p. 113.

Kuina, Japanese (Blakiston).

Adult. (Ceylon: Poole Museum.) Length (from mounted specimen) 10·0 inches; wing 5·0; tail 2·2; tarsus 1·45; mid toe, without claw, 1·45; hind toe 0·35; bill to gape 1·45, height at base 0·34.

Not mature. (Bengal.) Wing 5·2 inches; tail 2·1; tarsus 1·5; middle toe, without claw, 1·5; bill to gape 1·56.

Female. (Japan: not mature; Swinhoe collection.) Wing 5·0 inches; tail 2·2; tarsus 1·4; middle toe, without claw, 1·5; bill to gape 1·5, height at base 0·33.

"Iris red-brown; bill dull red, dusky on the culmen and tip; legs and feet dirty pale green." (*Jerdon.*)

(Ceylon.) Head, nape, and hind neck, and the central portion of the feathers of the back, scapulars, tertials, and tail brown-black, the margins of the feathers clear *yellowish* olive, very narrow on the head, and increasing on the back and remaining aforesaid parts, those of the tertials being very broad; edge of the wing white; lesser coverts and the inner feathers of the median and lesser series concolorous with the margins of the back-feathers; primary-coverts, primaries, and secondaries dark brown, the edge of the 1st quill somewhat pale, the margins of the tail-feathers duskier than the back; above the lores, on each side of the forehead, pale greyish, passing over the eye into the pale bluish grey of the sides of the head, face, fore neck, chest, and breast: lores dark brown, passing beneath the eye in a *well-defined stripe* to the ear-coverts; chin and gorge whitish, blending into the surrounding grey; flanks, sides of the abdomen, and the under tail-coverts black-brown, banded with white, except on the under tail-coverts, which are margined with it; under wing blackish brown, banded with white, along the edge white: thighs brown.

Obs. The above description is taken from the faded Poole specimen, aided, as regards the tints, by a reference to the Bengal and Japanese skins*; the distribution of colour is the same in each, and so are the tints, as can be seen by looking at those parts which happen to have kept their colour in the first-named example.

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* These are the only three examples I can trace anywhere in England. The species is wanting in the British Museum: and there is not a single specimen in the immense collection amassed by the late Marquis of Tweeddale, and now in the possession of Capt. Wardlaw Ramsay. The Bengal and Japanese examples are in Mr. Seebohm's museum.

Immature. The Japanese (Hakodadi) bird kindly lent to me by Mr. Seebohm presents the appearance of an immature bird, as it has the same character as examples of the European species which are not fully adult, namely, the outer series of wing-covert feathers barred with white; they are much more conspicuously marked than in an Essex skin of *R. aquaticus* before me, and the white bars are set off with black borders.

The Bengal bird is paler than the Japanese, and, judging by the wing-coverts, is an older bird, for they are marked with only a few bars of white; the chest and breast-feathers, however, are tipped with white, and in some places tinged with brown; the under tail-coverts are black, banded with white.

I look upon the present species as a well-marked eastern *race* of the European Water-Rail. Its describer, Blyth, separated it from the latter on account of its larger size, stouter bill, the stripe under the eye, and the different tint of the blue-grey. The first character scarcely holds good, I think, as the bill in the European bird varies: an example from Essex in my collection measures from forehead to tip 1·39, height at base 0·28; another fine male in the flesh now before me measures in the same way 1·63 and 0·4 inch. The remaining dimensions of the latter are—tail 2·3 inches, tarsus 1·7, middle toe 1·8: the difference in size, therefore, is only perceptible in the wing, as far as I can judge by the material at my disposal. Jerdon's dimensions are—length 10½ inches, wing 4·5 to 5·0, tail 2·0, tarsus 1·75, bill at front 1·5. The stripe seems to be a good character, as also the different colour of the face, fore neck, and chest, which are fine blue-grey (an altogether darker colour) in *R. aquaticus.* A further distinction, however, lies in the tint of the pale portion of the upper plumage, which is dull olive in *R. aquaticus*, and yellowish olive in *R. indicus*, although Asiatic specimens of the former seem to have the margins of the feathers yellower than European. The under tail-coverts are nearly all white in the European bird, whereas in the Indian they are black, margined with white.

Distribution.—The Ceylonese habitat of this Rail rests on the evidence of several examples which were procured at Jayelle by Lieut. Long, of the Ceylon Rifles, and given to Layard. They are referred to by this naturalist as follows:—"Three or four of these Rails were shot in the Jayelle paddy-fields, near Colombo, by Lieut. Long, of H.M. Ceylon Rifle Regiment, to whom I am indebted for these and several other interesting specimens." I infer that they were all procured at the same time, and during the cool season, as the species must, of course, be migratory to Ceylon, and as it is only at that period that this locality, which is about 14 miles out of Colombo, on the Negombo road, is resorted to by sportsmen.

In India it is scarce, as we do not find any mention of it by the numerous contributors to 'Stray Feathers' since the commencement of the journal in 1873. Jerdon writes of it:—"It appears to be rather a rare bird in Central and Southern India, and has chiefly been found during the cold season, being probably migratory, like some of the other Rails. . . . . . I have only seen it myself in Northern India; and Adams says that it is common in the Punjab." It is one of the species which Mr. Hume has noticed in the Calcutta market, with the remark that *P. akool* is rarer than it. Blyth notices two specimens in his catalogue, both procured near Calcutta, and says ('Ibis,' 1873) that he has seen dozens from Lower Bengal.

I do not find that it has been noticed by any one in the Burmese countries; but, notwithstanding, Swinhoe records it from China on the evidence of examples procured at Tientsin. This author likewise records a specimen from Hakodadi in Japan; and in their catalogue of the birds of these islands, Messrs. Blakiston and Pryer observe that it is a very common bird on banks of streams and ponds, is migratory to Yezo, and breeds about Yokohama. The localities they record it from are Yezo, Tokio, Yokohama, and Oyama in Legami. The Water-Rails procured by Dr. Scully in Kashgar are identified as *R. aquaticus*, which proves that the Indian species ranges only to the north-east of the empire, and is replaced to the north-west by the European bird, which, according to Blyth, has been sent to Mr. Gould from India; and which is doubtfully included by Hume in his recent list of Indian birds, not having been met with by any collectors of late years.

Habits.—In its economy the Indian Water-Rail does not differ from its European and Western-Asian ally, which it so closely resembles. Jerdon remarks that it frequents marshy ground, generally in rather thick covert. The locality which it seems to have chosen to frequent in Ceylon is eminently adapted to its habits. The Jayelle paddy-fields (a great resort for Snipe) are situated at the northern extremity of the great Mutturajawella swamp, and consist in parts of rushy morasses, in which the Water-Rail would find ample shelter and food. Its European relative frequents the rushy, sedgy borders of streams, and runs through the thick vegetation in a crouching position, with its neck stretched out, looking more like a rat than a bird. It

is difficult to flush, except when driven by hard frost into open places near unfrozen springs, &c., when it will lie close and get up under one's feet, flying with a moderately quick, but rather laboured flight. I have no doubt the present race is exactly similar in all its actions. The stomach of the Water-Rail is very muscular, and in it large pieces of gravel are sometimes found, swallowed, perhaps, to aid its digestion.

Nothing has been recorded of the nesting of this species.

Genus GALLINULA.

Bill shorter than in *Rallus*, deep at the base, much compressed; the culmen prolonged back upon the forehead into a small shield. Nostrils advanced. Wings rounded; the 2nd and 3rd quills the longest, and the 1st shorter than the 6th. Tail moderately short and rounded. Legs and feet stout. The tarsus compressed and shorter than the middle toe; tibia bare just above the knee. Tarsus shielded with transverse scutes in front, reticulate behind; anterior toes edged with a narrow membrane; hind toe much compressed.

GALLINULA CHLOROPUS.

(THE COMMON WATERHEN.)

Fulica chloropus, Linn. Syst. Nat. i. p. 258 (1766).

Gallinula chloropus (L.), Lath. Ind. Orn. p. 770 (1790); Blyth, Cat. B. Mus. A. S. B. p. 286 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 268; Jerdon, B. of Ind. iii. p. 718 (1864); Gould, B. of Europe, pl. 342 (1837); Schlegel, Mus. P.-B. *Ralli*, p. 45 (1865); Swinhoe, P. Z. S. 1871, p. 414; Holdsw. P. Z. S. 1872, p. 475; Saunders, Ibis, 1871, p. 225; Shelley, B. of Egypt, p. 275 (1872); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1225 (1873); Hume, Str. Feath. 1873, p. 250; Adam, *t. c.* p. 398; Irby, B. of Gibraltar, p. 144 (1875); Hume, Nests and Eggs, iii. p. 597 (1875); Walden, Trans. Z. S. 1875, ix. p. 228; Hume, Str. Feath. 1875, p. 187; Butler & Hume, ibid. 1876, p. 20; Scully, *t. c.* p. 192; Butler, ibid. 1877, p. 224; Blakiston & Pryer, Ibis, 1878, p. 225; Davison & Hume, Str. Feath. 1878 (B. of Tenass.), p. 466; Ball, ibid. vii. p. 229; Cripps, *t. c.* p. 306; Hume, ibid. 1879 (List of Ind. B.), p. 113; Dresser, B. of Eur. pt. 74 (1879).

Gallinula akool, Jerdon, Cat. B. S. India, Madr. Journ. 1844–45, xiii. no. 332.

Gallinula parvifrons, Blyth, J. A. S. B. 1843, xii. p. 180.

Gallinula burnesi, Blyth, J. A. S. 1844, xiii. p. 736.

La Poule d'eau, Buffon; *Moorhen*, commonly in England; *Gallinha de agua*, Portuguese; *Waterhoentje*, Dutch. *Di djadj el ma*, Arabic (Von Heuglin); *Zelya-kahal*, Moorish (Favier, *fide* Irby); *Khodan Kharonah*, Turki (Scully); *Godhan*, Hind.; *Jumbu-kodi*, *Boli-kodi*, Telugu; *Jal-murghi*, Hind.; *Dakak paira*, Bengal. (Jerdon); *Ban*, Japan.

Adult male and female. Length (Turkestan) "12·2 to 12·8 inches" (*Scully*); wing 6·5 to 7·3; tail 3·0 to 3·1; tarsus 1·8 to 2·1; middle toe 2·2 to 2·3, its claw 0·45; bill to gape 1·05 to 1·1, at front, from casque to tip, 1·4. The larger measurements refer to females. These dimensions, except the "length," are from a series of examples in the British Museum. An example in the Poole collection, procured by Layard in Ceylon, measures in the wing 6·5.

Dr. Scully's Turkestan measurements for wing in adults are 6·55 to 6·9, weight 6·2 to 6·4 oz.

A fine male in my own collection from Wales measured in the flesh:—Length 13·5 inches; wing 7·2, expanse 22·5; tail 3·1; tarsus 2·1; middle toe without claw 2·5, claw (straight) 0·6; bill to gape 1·25, at front from casque 1·6.

Iris red, with a slaty external edge; bill and casque, to beyond nostril, cherry-red, apical third (but more on the lower than the upper mandible) lemon-yellow; legs and feet yellowish green, front of the tarsus yellower than the rest; above the knee an orange-red garter, which varies in extent and brightness.

Head and neck slaty black (with an olive gloss in a strong light), passing into slaty on the lower part of the hind neck, and on the chest, breast, and upper flanks, the breast being paler than the rest of the fore parts; back, scapulars, and wing-coverts dusky brownish olive, darkening into rusty brown on the tertials and upper tail-coverts; winglet, primaries, and secondaries blackish slate; margin of the first quill and of the outer winglet-feather, the edge of the metacarpal coverts and of the wing from the shoulder to the winglet white; tail slaty black; a broad stripe of white on the upper webs of the flank-feathers; abdomen, vent, and thighs slaty bluish, the feathers fringed with white; central under tail-covert feathers coal-black, the lateral plumes (which are longer than the black central ones) pure white; under wing brownish black, the feathers faintly tipped with white.

The white stripes on the flanks vary in individuals as regards size and number; and the outer webs of the 1st quill and winglet-feather are scarcely white in some.

Young chick. Legs dark grey; iris greyish brown; bill red. Dark sooty brown, with white tips to the feathers of the chin.

Immature. Head and the upper parts olive-brown; throat whitish and ashy; feathers of the lower part of the breast greyish, tipped with whitish; the flank-stripes small and terminated with fulvous; bill dusky olive, reddish at the base of the upper mandible; shield small; legs and feet greenish; tarsus not so yellow as in the adult; no red garter above the knee. (October: Wales.)

An immature example from Manilla corresponds with the above; the whitish feathers of the chin and fore neck are tipped with blackish.

Obs. This is one of those species (spread over a large portion of the globe) which not unfrequently exhibit in individuals, and according to locality, external points of difference, but not to such an extent or of such a constant character as to admit of its division into races. It is in the matter of dimensions and size of frontal casque that the present bird chiefly varies. After an examination of a large series, Mr. Dresser comes to the conclusion that Indian examples differ from European in having a shorter wing and a larger frontal plate, reaching as far back as the anterior corner of the eye, or to within 0·15 inch of it. In the majority of European examples, so far as my personal examination tends to prove, there is a space of about 0·2 between the eye and the side of the plate; but there is doubtless some variation in this respect both in India and Europe. Indian examples decidedly appear to average shorter in the wing, as will be seen by a reference to Dr. Scully's measurements above quoted, as also by the fact that Mr. Hume tabulates his Sindh specimens at from 6·9 to 6·6 in the wing*, the smaller of which dimensions, however, relates to *females*. Schlegel's measurements of Asiatic and Philippine skins are:—Japan, wing 6·28 to 6·66; China, wing 6·18; Philippines, wing 6·25 to 6·34. The South-African race is smaller than the above—wing 6·05 to 6·3. Blyth's *G. burnesi* from Sindh is, in all probability, the immature of the present species. It was separated on account of its smaller size, and the outer web of the 1st primary being white, as also the border of the outer winglet-feathers and the orange garter being less developed; but these characters apply to immature *G. chloropus.* Besides which, Mr. Hume remarks that the specimens he assigns to this *race* have a smaller frontal plate, a white chin and throat, and a brown head, nape, and back—all of which are characters of the young of the common Moorhen. The American form (*G. galeata*) appears to be scarcely separable from the European, possessing merely a longer wing, which, according to Mr. Dresser's measurements of a series, varies from 6·7 to 7·4 inches.

The race inhabiting Madagascar has been separated by Professor Newton as *G. pyrrhorrhoa*, on account of having the frontal plate larger, the legs yellow, and the under tail-coverts buff.

Gallinula hæmatopus, Temm., from Celebes, is closely allied to the present species, but differs notably in wanting the flank-stripes, and the back is slaty bluish, not olive-green. An example in the national collection measures in the wing 7·3 inches, tarsus 2·3. The Moorhen of the Hawaiian Islands appears to be an interesting local form, which, like the last-named, is really a good species, inasmuch as its distinguishing characters do not entirely depend upon the very variable frontal shield, or a difference in size, but upon the coloration of the under surface, which wants the white markings on the abdomen, although it possesses the white flank-stripes. The frontal shield is, however, very large, reaching almost beyond the posterior corner of the eyes. It has been lately separated as *G. sandvicensis* by Dr. Streets, U.S. Navy.

Distribution.—The Common Waterhen does not appear to be a permanent resident in Ceylon, or it would be more often met with. It is exceedingly rare in the island; and I infer it is a visitor from the adjoining coast, wandering south, perhaps, during the prevalence of high northerly winds, and, after it reaches the shores of Ceylon, perhaps becoming stationary. It is possible, however, that, as it is in some parts of the world a bird of passage, migratory stragglers may visit Ceylon, returning again to India. But it has been so seldom observed in the island that any hypothesis as to its visits must remain mere conjecture until further observations have been made.

At present I only know of its having been twice met with. Layard, with his usual good fortune, obtained one specimen in a marsh near Pt. Pedro, and thus added the species to the avifauna of Ceylon. Recently a second example came under the notice of my friend Mr. Parker, and was shot in April this year (1879) at Nikaweratiya tank on the Kurunegala and Puttalam road. This is a large sheet of water, and a likely spot for such a bird as the Moorhen, which may perhaps inhabit other extensive tanks in the northern district of the island.

* And if we unite the supposed smaller North-Indian race *G. burnesi*, Blyth, these measurements fall as low as 6·0 inches.

In India the Moorhen is generally diffused throughout the country, and inhabits both the hills and the plains. It breeds as high as Ootacamund in the Nilghiris, and must therefore be a permanent resident in the uplands of Southern India. It does not, however, seem to have been met with by either Mr. Bourdillon or Dr. Fairbank, from which I infer that it is very local in its distribution. From the northern parts of India it is recorded by all who have collected of late years. Mr. Hume says that it abounds in every swamp and "broad" in Sindh. Captain Butler notes it from tanks between Deesa and Ahmedabad, and particularly from those near Milana, 18 miles from the former place; it is not, however, so common in this region as in Sindh. In the Sambhur-Lake district, according to Mr. Adam, it abounds. Messrs. Davidson and Wender say that it is not rare in the Deccan. Passing over the north-eastern region of the peninsula, we find Mr. Ball recording it from the Rajmehal hills, Bardwan, Nowagarh, and Karial, and Mr. Hume from Raipur and Sambalpur, south of the Mahanadi; the latter gentleman also observes that it is brought into the Calcutta market at times; and Mr. Cripps has met with it in February in Furreedpore. In North-eastern Cachar Mr. Inglis affirms that it is very common; and the same is recorded of it as regards Upper Pegu by Mr. Oates. In Tenasserim it is said to be confined to the north and central portions of the province; and Mr. Davison procured one specimen at a place called Shymotee.

Throughout China and Formosa it is, says Swinhoe, to be found, and, according to Père David, is abundant near Pekin. Crossing over to the Philippines, we find it again an inhabitant of that extensive archipelago; Cuming procured it there; and Lord Walden cites (*l. c.*) two examples from Luzon obtained by Herr Meyer. It extends northward to Japan, and is included in Messrs. Blakiston and Pryer's list of birds as frequenting Tokio, Yezo, and Yokohama.

Returning now to India, and following it to the north-west of the empire, we find Stoliczka observing it breeding on the Woolar lake in Cashmir; and across the range it is common, says Dr. Scully, in the plains of Eastern Turkestan in summer, though he never saw it in winter. Severtzoff says that it breeds in the south-eastern, south-western, and north-western districts of this country, ranging for that purpose as high as 4000 feet. In Central Asia it breeds at Lake Tsaidemin-nor, but, writes Prjevalsky, does not occur in the Ussuri country. Middendorff does not record it from Siberia, nor Schrenck from Amoorland, so that we cannot accurately define its northernmost limit in Central Asia. In Palestine and in Asia Minor it is found at all seasons.

It is resident in some of the islands of the Mediterranean, but not common in Corsica. In Italy it is migratory in some parts of the country; for Dr. H. Giglioni affirms that it arrives in the neighbourhood of Pisa in April, and is then very common there. In Transylvania Messrs. Alston and Harvie Brown likewise testify to its being a migrant. In the south of Spain Col. Irby states that it is resident, being tolerably plentiful and generally distributed in all suitable localities. Mr. Saunders found it breeding near Seville; and Lord Lilford observed it in the Madrid neighbourhood. In France, Germany, Holland, and the British Isles it is a common bird, not breeding, however, in Shetland. It passes through Heligoland, according to Herr Gätke, in April and May, returning in August and September. It ranges as far north as the Central parts of Sweden, and is sometimes seen in Finland. The Faroe islands are also inhabited by it.

As regards the continent of Africa, it is resident, according to Favier, in the vicinity of Tangier; and in Lower Egypt and the Fayoom it is, says Capt. Shelley, plentiful in some districts; elsewhere in the country he did not meet with it, though he supposes that it is probably distributed throughout it. Von Heuglin writes that it is a bird of passage to North-east Africa and the Arabian coast, remaining in these regions from October till March, during which period it is common in Abyssinia, ranging as far south as the Gala district, and ascending the highlands to an altitude of 10,000 feet. This author likewise considers it probable that it breeds in the delta of the Nile. It ranges down the entire continent of South Africa, and has been obtained at Mozambique and in the islands of Mauritius and Réunion, and likewise in the Seychelles. Mr. F. Barratt shot it in the Transvaal and on the Orange River, and procured it in Pretoria in December. Layard says it is not uncommon in Cape Colony; and it has also been obtained in Damara Land.

On the west coast it inhabits Senegal, and has been obtained in Angola, Benguela, and the island of St. Thomas. Mr. Du Cane Godman notes it as a straggler to the island of Madeira, and considers that it has been introduced into St. Michael's (Azores), where it is found on the Lagoa do Fogo.

Habits.—In Eastern climes the Moorhen is, in common with most of the "Skulkers," found about jheels, tanks, swamps, overgrown paddy-fields, and the like. In Great Britain and Europe it affects alike the banks of rivers, the margins of brooks and streams, large and small, the reedy shores of lakes, and (in England) ornamental waters, artificial ponds, both in demesnes and farm-fields, as well as moors and marshes. Indeed it would be hard to say where it will not take up its abode as long as it is unmolested and there is sufficient food for its sustenance, and cover of suitable kind for it to nest in. It is, as most Englishmen know, one of the chief ornaments of all aquatic spots, whether it be in the park, where the shier Duck and Teal seldom venture to put in an appearance, but where the Moorhen swims fearlessly about or plumes itself on the green laurel-planted banks; or whether it be at the bottom of the pretty elm-bordered field, where it can be seen from the farmhouse door stalking warily along the hedge by the trickling brook, with its bright-red bill bobbing forward and its white tail jerking up at each step. In these and in the many other spots where it makes itself at home, the Moorhen must always be to the lover of nature a favourite bird. I have seen half a dozen together on a lonely upland pool in Wales at an elevation of 1000 feet above the sea, which looked a most uninviting spot, but where the Waterhen seemed quite as much at home as on the lowland brook. It often affects the vicinity of houses, being, in fact, by nature the reverse of shy, and accustomed to accommodate itself speedily to circumstances, as must be apparent to those who have seen it stalking unconcernedly about sedgy spots while a train dashes by within a few yards of it.

It swims very well, and passes much of its time afloat, though it does not progress rapidly on the water. It dives well, and when surprised or chased in a spot where it has but little room to escape, it possesses remarkable powers of concealing itself, such as forcing its way into a crevice beneath a bank, or sinking under water with its bill only projecting, to enable it to breathe, and usually hidden by some floating leaf or reed, where it will remain perfectly motionless until the danger it avoids is past. It likewise climbs with facility, and conceals itself among the branches of thick shrubs. Unless disturbed it rarely takes wing, though I have occasionally seen it of its own accord fly across rivers in Great Britain: its flight is laboured, and generally along the surface of the water. Its food is usually vegetable matter, and is mixed often with a considerable quantity of gravel, which, acted upon by the powerful muscles of its stomach, must rapidly perform the functions of digestion. It also consumes aquatic insects, larvæ, and fish, and when pressed by hunger becomes a perfectly omnivorous creature. Lord Lilford states that it will even kill and devour young birds of all sorts, and is consequently very destructive to game. Von Heuglin writes of it, as observed in Africa, that though it is sometimes met with in abundance, it is never seen collected in large flocks like Coots, and that it prefers the smaller sedge- and rush-covered streams that exist in upland moors to large open waters, although it is seen, now and then, on wild brooks which are lined with overhanging bushes. He noticed that the migration takes place at night, the birds following the course of water in their flight.

Dr. Scully observed that in the jheels in Turkestan they ran about with great ease on the fallen rushes floating on the surface of the water.

Nidification.—Regarding the breeding of the Waterhen in India, we gather from Mr. Hume's 'Nests and Eggs' (*l. c.*) that the season lasts from May till September, during which period they have two broods. In the plains they lay in July, August, and September. "The nest," writes Mr. Hume, "varies much in size and situation. Sometimes there is no nest at all, only a quantity of rush and rice bent down *in situ* to form a platform to support the eggs. Sometimes it is built up in the water like a Coot's. Often it is in some tuft or tussock of grass in a swamp, ditch, or pond. Occasionally it is wedged up several inches above the water in some tamarisk or babool-bush growing in a lake or jheel. In these latter cases (and I have seen two such) the nest is rather neater and more carefully built, composed of soft dry flag, with a well-formed shallow circular cavity, lined with somewhat firm rush. Generally the nest, when there is one, though firm enough (not nearly so firm, however, as a Coot's), is a rather ragged affair, the lower portion rotting in the water, and the upper part very carelessly put together of dry or half-dry straw, flags, rush, or reed, and not unfrequently an admixture of weeds." Nine is considered the full complement of eggs; and Mr. Hume finds that they are undistinguishable from specimens collected in Europe. The shell is described as "compact and firm, with little or no gloss. In shape the eggs are normally moderately broad, nearly perfect ovals, slightly compressed

towards one end; but somewhat more pointed or elongated examples occur. The ground is a pale stone-colour, commonly tinted with pink when fresh. Some eggs are a very pale pinkish drab colour, others almost pale whity brown. They are more or less thickly sprinkled with spots, specks, and moderately-sized blotches of deep red, reddish brown, and purple, as the case may be." Sometimes the general appearance of the egg is streaked, the markings being often more or less grouped along irregular lines, running lengthways with the egg. The average size of twenty eggs is 1·62 by 1·21.

I have frequently found the nest of the Moorhen in England, and it is sometimes built and concealed in an interesting manner. On reference to my oological notes made in Essex in 1866–67, I find that the nesting-time in that part of England is at the latter end of April and beginning of May; and I transcribe the following particulars from an old note-book with reference to the breeding of this bird in Pitsea Island:—"Most of the nests were built *in* water, though not in such deep water as the Coot's. Some rested on the mud left dry among the reeds; these were not very deep or thick, and were slovenly constructed of green reeds and 'flags,' lined with the blades of dry reeds and also of green ones; they were fixed between reeds growing out of the mud, and none were nearer to the shore than a few yards. In the first nest I found there was but one fresh egg; this was standing in water of a few inches deep, and was built up in pile-fashion from the bottom, and kept in its place by the standing reeds; the lining of the nest was made up of bits of the blade of the reed. The egg was of a stone-yellow ground-colour, spotted evenly throughout with rather small spots of lilac-red and brownish red. Dimensions 1·55 by 1·21 inch. A second nest was built up in the same fashion, but a few blades of the supporting reeds were bent down over it, so that it was slightly concealed. There were four eggs, slightly incubated, in this one, longer in shape than the above-mentioned, and of a yellower ground-colour, and with lighter-coloured spots mingled with a few dashes of lilac. In another nest similarly constructed there were two fresh eggs, which differed totally from both the aforesaid; they were blunt ovals, similarly shaped at each end, and of a buff ground-colour, blotched with tolerably large blotches of lilac and a few blots of light red and slaty blue: they measured 1·67 by 1·21 inch. A fourth nest was built in water on the roots of reeds, and supported by their stalks all round; it was raised up like a Coot's, with perpendicular sides, to a height of 8 or 9 inches from the surface of the water: the body of the nest was constructed of reed-stalks, lined with blades cut into lengths of 3 or 4 inches. The green blades of the supporting reeds were bent down over the nest, and woven in among one another in a very clever manner, forming the framework of a complete dome over the nest. There were eleven eggs in this nest, differing in a very marked manner. Three or four were small and stumpy in form, with a whitish-yellow ground-colour, spotted sparingly throughout with blue, lilac-red, and brownish red; they measured 1·45 by 1·08 inch: the rest were somewhat pyriform, round at the large end, and rather tapering at the small, with a reddish-yellow ground-colour, marked with very irregular blotches of dark red-brown and dark slate-colour, mingled with smaller spots of the same colour; they measured 1·76 by 1·26. These two types were evidently the produce of two birds."

The Moorhen sometimes builds in trees; and the late Mr. E. Newman, who was a diligent oologist, mentions having seen the nest high up in spruce firs near the bole, and also out at the end of a branch, while at other times he found it on horizontal boughs or on the top of pollard willows.

Subgenus ERYTHRA.

Bill longer than in *Gallinula*; the culmen scarcely prolonged upon the forehead; 2nd quill shorter than the 3rd. Tarsus proportionately longer, equal to the middle toe without its claw.

ERYTHRA PHŒNICURA.

(THE WHITE-BREASTED WATERHEN.)

Rallus phœnicurus, Forster, Ind. Zool. p. 19, pl. 9 (1781), ex Ceylon; Gmelin, ed. Syst. Nat. i. p. 715 (1788).

Gallinula phœnicura (Forst.), Lath. Ind. Orn. ii. p. 770 (1790); Kelaart, Prodromus, Cat. p. 135 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 268; Jerdon, B. of Ind. iii. p. 720 (1864); Schlegel, Mus. Pays-Bas, *Ralli*, p. 41 (1865); Swinhoe, P. Z. S. 1871, p. 414; Holdsw. P. Z. S. 1872, p. 476; Hume, Str. Feath. 1873, p. 424, et 1874, p. 300; Legge, Ibis, 1875, p. 276; Hume, Nests and Eggs, iii. p. 599 (1875); Butler & Hume, Str. Feath. 1876, p. 21; Fairbank, *t. c.* p. 263; Butler, ibid. 1877, p. 224; Davison & Hume, ibid. 1878 (B. of Tenass.), p. 466; Ball, ibid. viii. p. 229.

Gallinula javanica, Horsf. Trans. Linn. Soc. xiii. p. 136 (1821); Sykes, Cat. B. Deccan, P. Z. S. 1832, p. 164.

Porzana phœnicura (Penn.), Blyth, Cat. B. Mus. A. S. B. p. 284 (1849); id. Ibis, 1867, p. 171; Hume, Str. Feath. 1873, p. 251.

Erythra phœnicura (Penn.), Reich. Syst. Av. Nat. p. 21 (1852); Walden, Trans. Z. S. 1872, viii. p. 94; Salvadori, Uccelli di Born. p. 340 (1874); Walden, Trans. Zool. Soc. 1875, ix. p. 229; Davidson & Wender, Str. Feath. 1878, vii. p. 90; Cripps, *t. c.* p. 306; Hume, ibid. 1879 (B. of Malay Penin.), p. 70; id. *t. c.* (List. Ind. Birds), p. 113.

Das rothgeschwanzte Wasserhuhn, Forster; *Red-tailed Gallinule*, Kelaart. *Burok-Burok*, Borneo (Mottley); *Kaloo-givet*,' Arrakan; *Roa Roa*, Malay; *Eri-Bombo*, Java (Blyth); *Meres*, Celebes (Meyer); *Dawak*, *Dahak*, Hind.; *Boli-kodi*, Telugu; *Kureyn* of the Gonds; *Kurayi*, Sindh (Jerdon); *Tannir koli*, Ceylonese Tamils; also *Kanung-koli*. *Korowaka*, Sinhalese, from its call.

Adult male and female. Length 12·0 inches; wing 6·1 to 6·2; tail 2·4; tarsus 2·1 to 2·25; bare tibia 1·0; mid toe and claw 2·5 to 2·6; bill to gape 1·5.

Iris varying from brown to brownish red; bill green, culmen dark, and the shield or base of culmen red; tibia, knees, and toes yellowish olivaceous, the tarsus washed with olive-brown; claws olive-brown.

Head, upper surface, sides of chest and breast, wings, and tail deep slaty olive-green, passing somewhat into rusty olive on the rump, and suffused with a slaty hue on the sides of the chest and breast: forehead, face, fore neck, down the centre of chest and breast white, passing over the eye, and separated by a black border from the olive-green, which border is variable in width and blends into the upper colours; 1st primary with a white edge; sides of rump, tibia-coverts, and under tail-coverts light chestnut, fading into rufescent on the abdomen; thighs rufescent white in front and olive-brown behind.

The width of the white frontal band depends on age; in fully adult birds it is about 0·35 inch in breadth. A specimen in abraded plumage in my collection has the feathers of the back tipped with grey; and Mr. Holdsworth calls attention to a similar specimen.

Young. When first hatched the chick is covered with black down. After leaving the nest, and following the parent, the back becomes edged with pale brownish; a stripe on each side of the chin and the sides of the belly whitish; wing-coverts and breast with faint light bars; sides of the rump and under tail-coverts rufescent.

An example now before me, partly feathered and partly in down, has the ear-coverts greyish white, and the face and lores black, mingled with a few whitish feathers, one or two of which are also present above the eye and on the forehead; the centre of the chin is black; but on either side the throat is white, and the feathers of the fore neck are whitish, tipped with slaty, which spreads over the chest, and then gives way to white on the centre of the breast.

Iris brown; bill black; legs and feet dusky olive-brown.

Obs. As will be seen from a perusal of the above description of the young, the frontal band and white face are wanting in youth; and it is evident that the first-year examples vary considerably in the extent to which these characters are acquired: in some there is not a trace of white on the forehead; in others there is a narrow frontal band and no white above the eye; in some, again, there *is* a narrow white supercilium; in others the face and forehead are concolorous with the head, but with a few white feathers here and there, showing that eventually the parts in question will become white. This variableness has given rise to the opinion that there may be two species; but such is not the case. Jerdon omits mention of the white face and forehead, and evidently took his description from an immature example. Mr. Holdsworth notices this fact, and speaks of a specimen in the British Museum from the "Indian Archipelago," in which the white is confined to the underparts, the forehead and face in a line with the lower mandible being blackish. I have carefully examined this bird, and find that there are whitish and white-tipped feathers on the face, and it is consequently an immature bird. The forehead has no appearance of immediate change; but some examples, as I have already stated, have the face white and the forehead black, the latter probably not changing until the third moult. The measurements of the bird in question are similar to those of Indian examples; they are:—wing 6·6 inches; tail 2·8; tarsus 2·3; bill to gape 1·5. A series of skins I have examined from India measure as follows:—wing 5·6 to 6·7 inches; tarsus 2·1 to 2·3; bill to gape 1·3 to 1·4. Adult specimens from the mainland correspond in coloration exactly with Ceylonese, with, of course, variations in individuals as to the breadth of the white frontal band, as in insular birds.

Mr. Hume notices some interesting points of difference between Andaman and Nicobar examples and Indian. These consist in the forehead having sometimes much more white than is ever seen in the latter, this colour extending back as much as 1 inch from the bill, whereas on the under surface there is less white, and the lower belly, vent, and tibial plumes are darker—that is, chestnut-coloured instead of pale rufescent. These characters seem to be acquired with age, some specimens corresponding with Indian birds. The wing in four female examples varied from 6·0 to 6·5 inches. Examples from Acheen, in Western Sumatra, resemble, says Mr. Hume, Indian, and not Nicobar birds.

I have compared the following specimens in the national collection with some from Ceylon:—

(Java) ♂. Identical in hue of upper surface, with the same amount of white on the forehead, face, and under surface: wing 6·0; tarsus 2·1.

(Celebes) (*a*) ♀. Same amount of white on forehead and face; upper surface slightly differing; more greenish on the rump: wing 5·8 inches; tarsus 1·95. (*b*) Similar to Ceylonese: wing 6·7 inches; tarsus 2·2. (*c*) Immature, in the act of acquiring the white forehead; the centre part white, and the sides dark.

(Banjermassing, Borneo.) Similar to Ceylonese: wing 5·7 inches.

(Timor.) Immature: face and forehead dark, spotted with white. This is apparently the *Gallinula leucomelana* of S. Müller; but it does not appear to be separable from true *E. phœnicura*.

Lastly, I must remark that the White-breasted Waterhen varies, like the Common Crow, considerably in size of body, though there is not perhaps a corresponding shortness of wing. This is observable even when they are seen at large; and Mr. Bligh lately writes me of an example (male), lately procured, which was so small as to lead him to think that there must be two species in Ceylon.

Distribution.—This Waterhen is universally distributed throughout the low country from Jaffna to Dondra Head, and from Colombo across to Batticaloa; and is nowhere more common than about Colombo, where it is resident all round the lake, breeding freely on its shores. In the western and south-western portions of the island, which are well watered by both rivers and small streams and brooks, and abundantly covered with paddy-fields, it is exceedingly common, and is met with almost everywhere where there is water. In the eastern and western districts it is chiefly confined to large sheets of water and the numerous village tanks, the

only source of irrigation at the disposal of the inhabitants living in these forest-regions. It affects the shores of moderately brackish lagoons, which are surrounded by mangroves and other jungle, such as the Amblangoda, Kogalla, and Panadure lakes; but it is not found on the salt-lagoons of the Eastern Province. It extends into the hills to a moderate elevation, keeping to the well-watered valleys in the Kandy district; and it may be frequently observed about the terraced paddy-fields of the Kandyans. I have known it occur in this part of the Central Province up to 2000 feet elevation. In Uva, however, it ascends much higher, frequenting the country lying between Badulla and Fort Macdonald, so that it must reach an altitude of more than 3000 feet in this district.

It is very abundant in suitable localities throughout peninsular India, not ranging, however, in any great numbers towards the north-west of the empire, where its place is taken by the preceding species. It is common in the Carnatic, and, according to Messrs. Davidson and Wender, it is likewise so in the Deccan; near Mahabaleshwar it is recorded by the Rev. Dr. Fairbank from the Koina River. It is not uncommon about Bombay. Further north, on this side, it becomes rarer. Captain Butler says it is tolerably common at Milana; but in Guzerat and about Mt. Aboo generally it is rare. Mr. Hume writes, notwithstanding, that he has seen many specimens from Mt. Aboo, but none from Northern Guzerat or Judhpoor; and in Sindh it occurs only along the canals; in Cutch and Kattiawar it is also found, but not commonly. The province of Sindh appears to be its limit in this direction. Turning to the east I observe that Mr. Blewitt found it breeding in Saugor, Raipur, and Sambalpur; and Mr. Ball remarks that it is occasionally met with in Chota Nagpur, afterwards instancing in his list Loharduga, Sirguja, Raipur, Nowagarh, and Karial as the localities where he observed it. Mr. Cripps writes that it is very common in Furreedpore; and Mr. Hume notes that it is from time to time brought into the Calcutta market, so that it cannot but be plentiful in the neighbourhood of the capital. In Upper Pegu Mr. Oates found it common; and Captain Wardlaw Ramsay procured it at Tonghoo. In the Province of Tenasserim it is pretty common in suitable localities, being recorded by Messrs. Hume and Davison from Paphoon, Wimpong, Kancc, Pabyouk, Amherst, Tavoy, and Bankasoon. In the Malay Peninsula it was procured at Malacca by Eyton.

In the Andaman and Nicobar Islands it is found everywhere in suitable localities; and Mr. Davison found it common about creeks in Acheen (N.W. Sumatra); it has likewise been obtained in Sumatra by S. Müller, and recently in the Lampong district by Mr. Buxton. In Java it is not uncommon, and has been procured there by Horsfield, Boie, and Diard; the same may be said of Borneo, where it has been recorded from Sarawak, Banjermassing, Brunei, and other localities. It likewise inhabits the adjoining island of Labuan, and it has been procured in the island of Banca, between Borneo and Sumatra. In Celebes it has been obtained in various localities by several travellers, and recently by Herr Meyer at Menado and Kakas. I have above recorded a specimen from Timor which I believe to belong to this species. In the Philippines Von Martens procured it at Zamboanga, in the island of Mindanao. Turning north to the eastern coasts of the mainland we find it inhabiting South China and Formosa, according to Père David and Swinhoe; but we have no record of its ranging into the northern parts of the Celestial empire.

Habits.—The White-breasted Waterhen, which is, in a great measure, the Ceylonese representative of the Moorhen, like it frequents the borders of tanks, swamps, morasses, wet paddy-fields, brooks, ponds, and, in fact, any spot containing fresh water of permanent duration. It is much more of a "skulker," however, than its European relative, and is capable of frequenting the margins of some pool or pond close to one's house for months without often giving one a chance of seeing it, although its extraordinary and unbird-like cries do not fail every morning and evening loudly to proclaim its whereabouts. It prefers situations where the banks are overhung with bushes or densely matted with screw-pines (its favourite retreat) to reedy sedgy spots, although, where such exist at the margins of large tanks or swamps, it does not refuse to affect them. In cultivated country among the villages of the interior it is frequently seen away from water, frequenting the vicinity of thick hedges and damp scrub, into which it quickly darts when it espies the sportsman, although it does not seem to mind the presence of natives in its vicinity. It runs with great speed, and, according to my observation, rarely ever takes wing, and very seldom enters the water; in fact it has more the habits and nature of a Rail than a true Waterhen. When roused out of a screw-pine or other tree in which it may have been perched, it will fly a short distance and with moderate speed, but it quickly drops to the bank and runs under cover.

I have nowhere seen it so tame as on the borders of the Slave-Island lake. Here a pair frequented the vicinity of my compound, which extended from the bungalow on the "Galle face" to the edge of the water, and passed their time between feeding in a little sedgy inlet and lurking beneath some screw-pines (*Pandanus*) which grew in the adjoining grounds. In the mornings they frequently ventured on to the open grass at the end of the garden; and one evening, after a very heavy monsoon shower, they perched on the top of a bamboo fence for a considerable time, and plumed themselves like Sparrows. In this locality I had ample opportunity of listening to the extraordinary cries for which this species is celebrated. Wonderful as they are, and most unnatural as proceeding from the throat of a bird, I cannot but admit that they are to my ears very interesting from the bare fact of their being so remarkable. It cannot be denied that they would startle a new arrival in the colony, if uttered beneath his windows on the first moonlight night that he was destined to repose in one of the beautiful bungalows in Colpetty; and he might probably spring to the window and anxiously inquire who was being strangled! Yet as soon as he knew that they were merely the outcome of the vocal powers of two timid little Waterhens rejoicing in the cool of the tropical night, his alarm would be turned into pleasure at listening to such strange bird-notes. It would be difficult to give to my European readers an adequate idea of the sounds by attempting to syllabize them; but they commence somewhat with the syllables *quaor, quaor, quaor,* slowly pronounced at first, and then accelerated and breaking into *korowak wok, korowak wok-wok, korowok wok*; this is changed into a very deep *quoor, quoor, qu-ōoor,* ending slowly and with apparent effort, as if the bird's throat had suddenly become very sore with its exertions.

A writer in India, Mr. E. H. Aitken, takes a less favourable view of the matter, and, in his notes to Mr. Hume for 'Nests and Eggs,' says, "In September 1878 I was living at Bombay in a house surrounded by very low-lying fields, which were under water nearly all the monsoon, and, of course, became the resort of various water-birds. Among them this year were half a dozen of this *Gallinula*, which very soon made their presence known by their awful cries. I cannot understand Dr. Jerdon dismissing the cry of this bird, if he ever heard it during the breeding-season, with the words 'has a loud call.' Any thing more unearthly proceeding from the throat of a bird I never heard. It began with loud harsh roars, which might have been elicited from a bear by roasting it slowly over a large fire, then suddenly changed to a clear note, repeated like the coo of a Dove."

Of their habits he writes, "Often in the morning two or three of the birds might be seen in some little open space fighting like young cock-chickens. When flushed they seldom flew far, seeming to trust more to their legs than their wings." Jerdon notices that it runs with great rapidity and erect tail, and climbs with facility through the thick shrubs and reeds, from which it is dislodged with difficulty. In the Andamans Mr. Davison found it in secondary jungle, sugarcane- and paddy-fields, along the edges of mangrove-swamps, and anywhere where there was cover.

Blyth remarks in a note on this species as follows:—"Its blood is accounted a valuable remedy by the natives of Bengal, as is also that of *Casarca rutila* (the Ruddy Shieldrake); hence in the bazar the dealers want a higher price for *Porzana phœnicura* than for other birds of its size."

The food of the White-breasted Waterhen consists of grain, seeds of aquatic plants, and other vegetable matter, and also insects. Herr Meyer notices that it scratches in the ground with its feet for its food like a fowl.

Nidification.—Regarding the nesting of this species I cannot do better than transcribe here the notes I sent some years ago to Mr. Hume on the subject. They are as follows:—"I have found the eggs of *E. phœnicura* in the Western Province from the beginning of June to the latter part of September. On the edge of the Colombo Lake a number of nests taken were constructed in a variety of situations: some on the ground, of reeds and grass-stalks; others on tussocks surrounded by water, and made of the same materials laid on the top of the tussock, the stalks of which were beaten down for a foundation; others on the branches of the screw-pine, one of these being at a height of 10 feet from the ground. These last were flat and shallow, and made of the leaves of aquatic plants and blades of rushes. As a rule the top of the nest is almost flat, without any hollow for the reception of the eggs, and the materials of the interior are generally laid across each other, somewhat regularly. One nest, found on the branches of a *Pandanus*, was constructed entirely of the dead stems of a creeper with which this tree was covered. The same remarkable difference exists in

eggs of what appear to be the same clutch in this species as in those of *Gallinula chloropus*; some of them I have seen long and pointed at both ends, some oval, and others stumpy and pointed at the smaller end, being somewhat pyriform in shape.

"The ground-colour is yellowish grey or reddish white; some are marked all over the surface and in a zone round the obtuse end with yellowish-brown and light-red spots and blotches over others of bluish and greenish grey, while others are marked more sparingly with large blotches of the same hues. I have never found more than four eggs in one nest. Two specimens from the same nest measure respectively 1·65 by 1·23 and 1·57 by 1·18 inch; others I have range from 1·5 to 1·52 in length, and from 1·1 to 1·25 in breadth."

To this I would add that the breeding-season in the Western Province is in May, June, and July; but at Kurunegala I have obtained young chicks in December, by which I infer that two broods are reared in the year.

In India it breeds from July until September, nesting sometimes in trees, as in Ceylon. Mr. Aitken describes the position of a nest as in the top of a date-palm, the outer structure appearing to consist of an old Crow's nest; the old bird made its way up to it after he had replaced the eggs, "not flying, but running up the rough bark of the date like a ladder." The eggs of this bird are described by Mr. Hume as being of a "dull stone-coloured ground, with rather bright slightly brownish-red spots, specks, and streaks, most numerous towards the large end, where, besides these, there are a number of faint inky-purple spots and streaks, which appear to underlie the brighter markings."

Mr. Oates recently, writing on Burmese birds, says this Waterhen *always* makes "its nest in trees, at heights not below 10 feet. It selects a creeper-grown tree, either in paddy-land or on the outside of forest. . . . . A bamboo bush, the leaves of which are well entangled, is also much affected. The nest is merely an irregular platform of dead and green leaves resting on a few twigs." The number of eggs found by him was four in each nest.

Genus GALLICREX.

Bill longer than in *Erythra*; the base of the culmen prolonged back upon the forehead more than in that genus, and developed, in the male, at breeding-time, into a fleshy crest or comb. Wings with the 2nd and 3rd quills subequal and longest, and the 1st shorter than the 6th. Tertials nearly equal to the primaries. Tail short and rounded. Legs long; tibia bare considerably above the knee. Tarsus equal to the middle toe; toes slender, the outer exceeding the inner; hind toe moderately long.

GALLICREX CINEREA.

(THE WATERCOCK.)

Fulica cinerea, Gm. ed. Syst. Nat. i. p. 702 (1788).

Gallinula cristata, Lath. Ind. Orn. ii. p. 773 (1790); Kelaart, Prodromus, Cat. p. 135 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 268; Schlegel, Mus. Pays-Bas, *Ralli*, p. 39 (1865).

Gallinula lugubris, Horsf. Tr. Linn. Soc. xiii. p. 195, ♂, Java (1821).

Gallinula gularis, Horsf. *l. c.* ♀.

Rallus rufescens, Vieill. Jerdon, Madras J. L. & Sc. xii. p. 205 (1840).

Gallicrex cristatus (Lath.), Blyth, Cat. B. Mus. A. S. B. p. 283 (1849); Jerdon, B. of Ind. iii. p. 716 (1864); Holdsw. P. Z. S. 1872, p. 475; Blanford, Str. Feath. 1877, p. 247.

Gallicrex cristata (Lath.), Blyth, Ibis, 1867, p. 171; Swinhoe, P. Z. S. 1871, p. 414; Adam, Str. Feath. 1873, p. 397; Salvadori, Ucc. di. Born. p. 340 (1874); Legge, Ibis, 1874, p. 31, et 1875, p. 403; Swinhoe, ibid. 1875, p. 134; Sharpe, ibid. 1879, p. 271.

Gallicrex cinereus (Gm.), Hume, Str. Feath. 1874, p. 300; id. Nests and Eggs, iii. p. 596 (1875); Hume & Oates, Str. Feath. 1875, p. 187; Hume & Davison, Str. Feath. 1878, p. 466 (B. of Tenass.); Ball, ibid. vii. p. 229; Cripps, *t. c.* p. 305; Hume, ibid. 1879, pp. 70, 113.

Gallicrex cinerea (Gm.), Walden, Trans. Zool. Soc. 1875, ix. p. 229; Oates, Str. Feath. 1877, p. 165; David & Oustalet, Ois. de la Chine, p. 484 (1877).

Crested Gallinule, Lath.; *Cock of the Reeds* (Swinhoe); "*Paddy-fowl*," Sportsmen in Ceylon. *Kora*, Hind., also *Kongra* (Jerdon); *Bontod Bureng*, Java (Blyth); *Hung-kwan*, lit. "Red Cap," Chinese.

Kittala, Sinhalese in North; *Willi-kukulu*, in South; *Tannirkoli*, Tamil.

Adult male (India: Brit. Museum). Wing 8·3 inches; tail 3·3; tarsus 2·6; middle toe 2·8, its claw (straight) 0·5; hind toe 1·3; bill to gape 1·36.

"Length 16·75 inches, Tenasserim" (*Davison*); "17·0, Upper Pegu" (*Oates*).

"Iris hazel-brown; eyelids smoky plumbeous; frontal shield and base of upper mandible deep dull red; horn pinkish; the bill, with the above exception, is yellow, there being a red spot at the base of the lower mandible; inside of mouth flesh-colour; legs plumbeous green; claws horny" (*Oates*).

In dried specimens the horn and shield appear dull red. The former rises up behind the shield, is pointed at the apex, and measures sometimes an inch in length.

Breeding-plumage (Amoy: May). Head, neck, throat, and underparts dull black; the feathers of the head, hind neck, and back with bluish-ashy margins, and those of the throat and under surface tipped with ashy grey; wings brown, the lesser coverts edged like the back, and the tertials and greater coverts edged with fulvous or yellowish brown; back and rump brown, with tawny edgings to the feathers; edge of the wing, outer web of first primary, and first winglet-feathers whitish; tail brown, the feathers edged similarly to the tertials; under tail-coverts buff-white, barred with blackish; under wing-coverts brown, edged with yellowish white; frontal plate and fleshy crest red.

Indian examples correspond with the above; but those in the national collection which I have examined are not in such perfect plumage, and I have therefore described a Chinese example.

An example in the national collection from Manilla shows the changing of the plumage from the breeding to the non-breeding dress, which is that of the female. The neck and under surface are whitish, barred with narrow

cross marks of dark slaty, and on the throat and fore neck some of the blackish nuptial feathers remain; the hind neck, back, and scapulars are chocolate-brown, passing with a fulvous hue into the buff of the margins of the feathers.

Blyth states that the hue of the breeding-season is assumed by a change of colouring in the non-breeding feathers, the caruncle or horn rising at the same time from the pointed frontal shield, into which it shrinks after breeding is over.

Female (Ceylon). Length 13·3 to 14·2 inches; wing 7·0 to 7·4; tail 2·8 to 3·1; tarsus 2·5 to 2·8; middle toe and claw 2·85 to 3·15; bill to gape 1·3 to 1·4.

Iris pale brown or yellow-brown; bill, upper mandible dark olive, the base near the forehead yellow or sometimes reddish, the lower mandible yellowish fleshy, with the gonys red in some; legs and feet greyish olive-green, the joints greenish yellow.

Top of the head, down the centre of hind neck, upper surface, inner wing-coverts, and tail sepia-brown, palest on the hind neck, and changing gradually on the outer wing-coverts to bluish slaty; the head almost uniform brown; the remaining portions deeply margined, except on the lower back, with tawny fulvous; margins of the greater coverts mottled with the ground-colour of the feathers; quills cinereous brown, slaty beneath the 1st primary, and along the front of the wing white; chin, throat, and abdomen whitish, blending into the brownish fulvous or tawny of the face, supercilium, fore neck, and underparts; neck, breast, flanks, and under tail-coverts crossed with wavy bars of cinereous brown, indistinct on the body, and darker and well-defined on the under tail-coverts; posterior portion of thighs brownish; under wing-coverts slaty, tipped with white. Some examples have the abdomen almost concolorous with the breast, and lightly barred.

Young. I have not succeeded in examining any young examples, and never procured any in Ceylon. The plumage in the immature stage has not, to my knowledge, been described, but it probably differs little from that of the female.

Obs. A comparison of Ceylonese female specimens of this bird with a series from India, Malaya, and China shows that it varies scarcely at all throughout its wide range, either in plumage or in size. The wings of those I have measured from Malaya and India vary from 7·2 to 7·5 inches.

Distribution.—The Watercock is a moderately common bird in Ceylon, but it is so skulking in its habits that it is not observed as often as it otherwise would be. Layard speaks of it as being "common in the south about Matara, frequenting the sedges" there; and I therefore conclude that he only noticed it in this district. In the neighbourhood of Colombo it came under Mr. Holdsworth's observation, for he remarks that it is common there; and, as a matter of fact, it is perhaps more plentiful round Colombo than in any other part of the Western Province, except perhaps in the extensive paddy-lands near the Bolgodde lake. I have seen it at Marandahn, Borella, and near Grand Pass, all within a radius of three miles of the town; and at Kaduwella and Kotte it is just as often met with. It has mostly come under my notice in these parts during the north-east monsoon (at Galle I never saw it between April and October); and there may be an internal migration towards the coast from the tank districts in the North-west Province, where it is abundant in certain places. Mr. Parker informs me that he has counted about seventy in sight at the same time round a tank not far from Wariyapola, in the Kurunegala district. It inhabits, as a rule, all the tanks in the northern part of the island; and I have procured it in a swamp close to the shore near Trincomalie, where it is by no means uncommon. It is found in the Jaffna peninsula, where Mr. F. Gordon, of the Oriental Bank, has procured it. It inhabits the tank districts in the Eastern Province; and I have seen it in suitable localities in the country to the north of Hambantota and also towards Yāla. I never obtained a male bird, but procured plenty of females, and saw them in other collections while in the island, none of which contained, however, any examples of the other sex: this is noteworthy. As to its distribution in the mainland, it may be said to be local, and, further, that it does not extend into the drier portions of the north-west of the empire. Mr. Hume says of it:—"The Watercock, so far as our Indian empire is concerned, is, I think, restricted to tracts where the rainfall is not less than 40 inches, and where night frosts are unknown

"It is common on the western coast of the peninsula, in the eastern portions of the Central Provinces, and in the neighbourhood of the Mahanuddy, throughout Lower Bengal . . . but it is almost unknown in the

drier portions of the centre of the peninsula, Behar, and the North-west Provinces (except in the sub-Himalayan zone), the Punjab, Rajpootana, and Sindh." Mr. Blanford, however, notes its occurrence in Sindh, and considers it to be a straggler to that Province. Mr. Adam only saw it once at the Sambhur Lake, and that is the sole record in 'Stray Feathers' of its occurrence in that part of India. Jerdon writes that it is far from common in Southern India, as also in Central India, but says that it is the reverse in Lower Bengal, and still more plentiful in Sylhet, Chittagong, and Burmah. Mr. Ball notes it from the Rajmehal hills and Manbhum; and Mr. Cripps says that it is very common during the rains (though absent in the cold weather) all over the country in Furreedpore, wherever there is standing paddy. He likewise speaks of it breeding in the Dacca and Tipperah districts.

Mr. Oates records it as common in Upper Pegu. Mr. Hume likewise records it from Arakan and Lower Pegu; but I observe that it did not come under Dr. Armstrong's notice in his exploration of the Irrawaddy Delta. Captain Wardlaw Ramsay procured it at Tonghoo; and Messrs. Hume and Davison only observed it in the central and northern portions of Tenasserim, noting it from Thatone, Attaran River, Tavoy, and Shymotee. The latter gentleman met with it commonly in the Andamans about Aberdeen, but did not see it at all in the Nicobars. From the Malay peninsula there is a specimen in the Calcutta Museum recorded by Blyth, and no doubt it is common there.

It is found in Java, where it was procured by S. Müller, Kuhl, Von Hasselt, and Diard. In Borneo it is probably pretty evenly distributed; for Mr. Mottley procured it in the extreme south at Banjermassing, and recently Mr. Treacher obtained it in the north-west on the Láwas river. From Borneo it extends (probably through Palawan) to the Philippines, where it is, however, only known as inhabiting Luzon, specimens having been procured at Manilla by Messrs. Cuming and Dussumier. In the island of Formosa Swinhoe obtained it; and on the mainland of China it is found as far north as Cheefoo, extending westward to Szechuen and, according to David, as far north as the basin of the Yangtse. It inhabits, in all probability, the intervening regions of Cochin China and Siam, in common with other species found in the Malay Peninsula and China.

Habits.—The Kora, as it is called in India, affects long grass, standing corn or paddy, sedgy, reedy marshes, and such-like damp situations which afford it complete cover. Although in wild districts, where it is very plentiful, it may be seen in the open, where its haunt is guarded by a belt of impenetrable jungle or scrub, yet in cultivated and inhabited districts it affects the greatest concealment in the daytime, and is, I imagine, entirely nocturnal as regards its manner of feeding and habit of moving about. I have never once seen it in paddy-fields or grassy swamps on the move, but have invariably put it up when firing at some other bird. It then flies swiftly and takes sometimes a long stretch on the wing, carrying its legs straight out behind it. I have generally found it among rather thick, moderately high rushes; but it frequently resorts to paddy-fields, and is consequently called "Paddy-fowl" by sportsmen, who flush it when Snipe-shooting, and generally do not let it escape, as its flesh is very good eating.

It has never been my good fortune to hear its remarkable note, which, I apprehend, is uttered chiefly in the breeding-season. Mr. Oates says it has a loud, deep, booming call, and that it is crepuscular in its habits. "Its stomach," he remarks, "is extremely muscular; one I examined contained green rice, rice-leaves, and a small shell."

Mr. Davison writes of it:—"The Watercock found at the Andamans belies its name by never (as far as I have observed) being found near water. The only places in which I have observed it are the sugarcane-fields; in these it is not uncommon, especially about Aberdeen. During the day it keeps under shelter; but in the morning and evening comes into the open to feed, seldom, however, wandering far from cover, to which it retreats on the slightest alarm." In Tenasserim the same writer states that these birds were most common about rice-fields in the mornings and evenings.

I have found its food to consist of paddy- and grass-seeds, usually mixed with aquatic insects. Jerdon has some interesting notes on its habits, which I transcribe as follows:—"It affects concealment much more than the Waterhens, running with activity through the tangled grass or paddy, or on the surface of weedy tanks. It feeds on rice and other grains, or shoots of various water-plants, and also on small mollusks and insects. It is a very noisy bird, and its loud, sonorous, booming cries, especially during the breeding-season, must be familiar to many.

"Taylor, in his 'Topography of Dacca,' states that the voice of this bird, before engaging in combat, is peculiar; the throat swells out and emits a deep hollow sound, which is continued for several seconds, and is suddenly followed by a shrill, vibratory cry like that of the Trumpeter Birds (*Psophia*) of South America. Like many of the Rails it is partially nocturnal in its habits. The male birds are said to fight furiously, and are much prized by the natives, who keep them for that purpose, especially in Dacca, Sylhet, &c. It is excellent eating, and according to a writer in the 'Indian Sporting Review,' 'the flesh, feather, and courage of the Kora are all game.'"

Mr. Cripps, however, states (Str. Feath. ii. p. 531) that they are kept rather for the purpose of catching wild ones. He writes:—"When a wild one is heard calling, the tame bird being let loose finds him out, and grappling keeps hold until the owner comes up and catches both. I know two zemindars in the Tipperah who are enthusiasts at this."

The same writer likewise affirms that the natives of the Dacca and Tipperah districts often *themselves* hatch the eggs of this species. "The *modus operandi*," he observes, "is to take half a cocoanut-shell, put a layer of cotton in, on top of which they place the egg and fill up with cotton; the shell is then placed on the man's stomach and tied on with a long strip of cloth, which is wound round his body. Until the egg is hatched the man never bathes."

Nidification.—The Watercock breeds in the south of Ceylon in July and August, nesting in wild localities in the interior. I had two eggs brought to me by a native in the Hinedun Pattuwa on the 16th of August, 1872, as belonging to the "*Willi-kukulu*," and I afterwards identified them as such. They are small for the size of the bird, narrow ovals in shape, very nearly the same at both ends, and very handsome. The ground-colour is creamy white, marked at the large end with brownish red, mixed with a few specks of bluish grey. In one egg the brownish red is in the form of blotches running in the direction of the axis, and confluent all over the end, forming a large cap of an almost uniform colour; in the other the coloration is in the form of a broad zone, having a very small pale centre. The smaller end is quite devoid of markings. They measure 1·62 by 1·13 inch, and 1·57 by 1·13 respectively.

Mr. MacVicar found a nest at Bolgodde in long grass; it was built of rushes and grass, and was a massive structure. There were two eggs only in the nest, of a reddish-white ground-colour, freckled over the whole surface with light red and reddish brown over small spots of faded lilac or bluish grey; at the large end the markings were confluent, especially in one specimen. They measured 1·52 by 1·1 and 1·58 by 1·14 inch respectively.

In Lower Bengal and in Burmah it breeds in July and August. Mr. Hume describes nests found in the former region as sometimes large Coot-like structures, made of flags and rice-straw, and placed in the middle of a dense tangled mass of reeds, rush, and water-weeds; and at other times comparatively slight nests of fine rush and grass on the floating leaves of Lotus and Singhara (*Trapa bispinosa*).

The ground-colour of the eggs is noted as pale yellowish or stone-colour, sometimes with a faint greenish tinge, occasionally almost white, thickly blotched and streaked with brownish red or slightly reddish brown and purple, or even deep red. As in the specimens above noticed, the markings are confluent at the obtuse end in most; but in some the whole surface is freckled. The smallest of Mr. Hume's series measures 1·58 by 1·12 inch; but he gives the average of a dozen as 1·7 by 1·27 inch.

Genus PORPHYRIO.

Bill large, rather short, very high at the base, much compressed or wedge-shaped; the culmen curved and produced back to the crown, covering the forehead with a shield. Nostrils oval, oblique, placed well forward and near the culmen; gonys deep and ascending. Wings rather long; the 2nd, 3rd, and 4th quills subequal and longest, and the 1st shorter than the 6th. Tail short, about equal to the tarsus. Legs long; tibia bare for more than the length of the hind toe. Tarsus shielded before and behind with broad rectangular scales. Toes very long, bordered by a narrow membrane, the middle one exceeding the tarsus, the outer much longer than the inner; claws stout and straight.

Tongue large, fleshy, and horny at the tip.

PORPHYRIO POLIOCEPHALUS.

(THE INDIAN BLUE COOT.)

Gallinula poliocephala, Lath. Ind. Orn. Suppl. p. 58 (1791).

Porphyrio poliocephalus (Lath.), Vieill. Nouv. Dict. Hist. Nat. tom. xxviii. p. 39 (1819); Gray, Gen. B. iii. p. 598 (1849); Blyth, Cat. B. Mus. A. S. B. p. 283 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 268; Jerdon, B. of Ind. iii. p. 713 (1864); Blyth, Ibis, 1867, p. 171; Holdsw. P. Z. S. 1872, p. 475; Legge, Ibis, 1874, p. 31, et 1875, p. 403; Blyth, B. Burmah, p. 161 (1875); Butler & Hume, Str. Feath. 1876, p. 20; Davison & Hume, ibid. 1878 (B. of Tenass.), p. 464; D. Elliot, ibid. 1878, vii. p. 22; Davidson & Wender, *t. c.* p. 89; Ball, *t. c.* p. 229; Cripps, *t. c.* p. 306; Hume, ibid. 1879 (List Ind. B.), p. 113.

Porphyrio smaragnotus, Sykes (Cat. B. Deccan), P. Z. S. 1832, p. 165 (*nec* Temm.).

Porphyrio neglectus, Schlegel, Mus. Pays-B. *Ralli*, p. 53 (1865); Hume, Str. Feath. 1873, p. 249; Hume & Oates, ibid. 1875, p. 185; Hume, Nests and Eggs, iii. p. 594 (1875).

Grey-headed Gallinule, Lath. Gen. Syn. Suppl. ii. p. 375 (1785); *Purple Coot*, *Blue Coot*, *Sultana Coot*, *Bald Coot*, of Europeans. *Keim*, *Kaima*, *Kalim*, *Kharim*, Hind.; *Kem*, Bengal.; *Nila Bola-kodi*, Telugu (Jerdon).

Kittala, Sinhalese (Layard); *Indura-kukula* in Southern Province; *Sannary*, Ceylonese Tamils (MacVicar).

Adult male and female. Length 16·5 to 17·8 inches; wing 9·8 to 10·2; tail 3·5 to 3·6; tarsus 3·2 to 3·7; middle toe 3·5 to 4·0, its claw (straight) 0·85 to 1·0; hind toe 1·3 to 1·4, claw (straight) 0·9; bill to gape 1·45 to 1·5: casque with culmen 2·2 to 2·5; height of bill at base 0·95 to 1·05; width of casque 0·87.

Iris red; bill and casque darker red, with dusky patches, chiefly on the sides; legs and feet red, the joints of the knees and toes blackish brown; claws pale brown.

Head, face, and throat greyish, tinged with bluish on the face and throat, and washed with brownish purple on the nape and upper part and sides of the hind neck, passing into purplish violet on the lower part of the hind neck, and thence into dark purplish blue on the back, scapulars, and rump; tail blackish, edged on the outer webs of the feathers with greenish blue: wings sombre greenish blue, the lesser wing-coverts edged with a brighter hue, the inner webs and the under surface of the quills black; fore neck purplish grey, passing into lively greenish blue on the chest; breast, flanks, and abdomen dark blue; thighs and under wing-coverts greenish blue, the greater series of feathers blackish; under tail-coverts white.

The plumage of the head and face is variable, both as regards the amount of grey and the tint of the colouring of the occiput, which is duskier in some examples than in others.

Young. The chick is said to be blackish, with the bill blue and red (the basal portion red), and bluish flesh-coloured legs and claws.

Birds of the year have the iris pale red, with the inner edge mottled with brown; bill red; legs and feet reddish, with the joints brownish.

Length about 15·0 inches; wing 9·0; tarsus 3·5.

The face, throat, and neck is more tinged with green than in the adult; the back of the head and neck brownish, with the feathers here and there tipped with greyish; the back and wings sombre greenish blue, passing into brown on the rump and upper tail-coverts, the feathers with pale tips; the greenish-blue chest-feathers are likewise pale-tipped, and the blue of the under surface not so pure as in the adult, with the edges of the feathers greyish; thighs cinereous bluish, with light edges to the feathers.

Obs. Indian examples correspond with Ceylonese in plumage. Some before me, from Madras, in the national collection measure as follows:—wing 9·2 to 9·5 inches; tarsus 3·0; middle toe 3·0 to 3·2; culmen (with casque) 2·5.

Mr. Cripps gives the measurements of a pair as follows:—♂. Length 16·6 inches; wing 9·83, expanse 31·0; tail 4·0; tarsus 3·3. ♀. Length 17·0; wing 10·0, expanse 30·0; tail 3·50; tarsus 3·6.

The dimensions of a ♀ Pegu example are recorded by Mr. Oates as:—Length 17·0 inches; wing 9·6; tail 4·0; tarsus 3·6; culmen (with casque) 2·55.

The genus *Porphyrio* has a singular distribution, the habitat of the species (with one exception) composing it stretching across, in a belt as it were, from Southern Europe through Western and Southern Asia, to China and the Philippines, and thence down through the Malay Archipelago, taking in some of the Western Pacific isles to New Zealand and Australia.

In his able paper on these curious birds, 'Stray Feathers,' 1878, written after an examination of the fine series in the Paris Museum, Mr. Elliot recognizes nine species, besides which Capt. Shelley has described a tenth from Egypt under the name of *P. alleni*, which seems to have been overlooked by that author.

For the information of Ceylon students I will here enumerate these species, many of which I have had the pleasure of inspecting in the British Museum, in the order taken by Mr. Elliot. They are:—

P. cyanocephalus, Vieill. *Hab.* Tasmania, through Eastern Australia to New Guinea, including New Zealand, New Caledonia, and the Chatham Islands.

Char. Back, wings, and tail black, beneath indigo-blue: wing 10·5 to 11·2 inches. Tasmanian specimens are very large.

P. veterum, Gmelin. *Hab.* Southern Europe, Northern Africa, and part of Asia Minor.

Char. Back, wings, and tail dark blue, lower parts blackish blue: "wing 10·75 inches" (*Elliot*).

P. bellus, Gould. *Hab.* Western Australia.

Char. Like *P. cyanocephalus*; chest paler blue; legs and feet *grass-green*: wing 10·5 inches.

P. calvus, Vieill. *Hab.* Malay Peninsula, Malay Archipelago, and Pacific isles.

Char. Face and chin black; shoulders of wings greenish blue; back olive-green; breast deep blue: wing 8·0 to 9·4 inches. An example from Samoa has much less of the bright blue along the shoulder of the wing than one from Fiji; but both measure alike in the wing 8·5 inches.

P. cœlestis, Swinhoe. *Hab.* China.

Char. Like *P. poliocephalus*, but with a white rump. [*N.B.* Seems to be a doubtful species, described from a bird in captivity, perhaps a partial albino.]

P. chloronotus, Vieill. *Hab.* Africa, Madagascar, Mauritius.

Char. Back green; wings blue; chin blackish; flanks and breast bluish purple.

P. poliocephalus. The subject of the present article.

P. edwardsi. *Hab.* Cochin China, Siam.

Char. Resembles *P. poliocephalus*, but is brighter blue on the chest, not so grey about the head; back, breast, and flanks violet-blue: wing 10·75 inches.

P. pulverulentus, Temm. *Hab.* Philippines.

Char. Head and breast greyish blue; back and tail reddish brown; wings blue: wing 9·5 inches.

P. alleni, Shelley. *Hab.* Egypt.

Char. Like *P. veterum*, but much smaller: wing 5·8 inches.

Distribution.—This species of Blue Coot is very generally distributed over Ceylon as regards the various ornithological districts into which the low country may be divided; but it is local, confining itself, for the most part, to tanks and waters which are either overgrown with reeds and other aquatic vegetable growth or bordered by the same. Thus in many secluded tanks in the jungle where one would expect to find it it is absent, and at others where there are large reed-beds or other tangled vegetation it is abundant, even though there be human habitations in the vicinity of its haunt. Of late years, before I left Ceylon, it became quite numerous in the Lotus Pond at Colombo, one of the most public waters in the island, where a dense mass of Lotus-plants and other weeds afforded it shelter; and hence it took up its quarters there. It is to be met with in the swamps beyond Borella and towards Heneratgoda; but in general the cultivated parts of the Western Province are not favourable to its habits. On the shores of the southern arm of the Bolgodde or Pantura Lake it is not uncommon; and the fine sheet of water at Ambalangoda has its share, Coots frequenting the sequestered inlets of its inner shores. In other secluded marshes southward towards Matara it is also found. I observed that it was abundant at Sittrawella and Tissa-Maha-Rama tanks, and met with it also in the Wellaway Korale. At the tanks of the Eastern Province it is common; and the Bintenne Lake is also frequented by it. In one spot near Trincomalie, already referred to in this work, namely the Tamara Kulam, it is very numerous, as also at Topoor tank; and the large Topare tank and other overgrown sheets of water in the interior form great resorts of this species. I do not know that it extends into Dumbara or ascends the hills on any other side.

On the mainland we find it generally distributed throughout India, where there are weedy tanks and jheels, extending through Arakan, Burmah, and the western part of Tenasserim, according to Mr. Hume, as far as 16° N. lat. In the south of the Peninsula we have but little data of its occurrence; we may, however, assume that its distribution is similar there to what it is in Ceylon, for Mr. Bourdillon found it in great numbers at the Vellarney Lake, at the base of the Travancore hills. The Rev. Dr. Fairbank, in his list of birds from the Khandala district, notes a specimen, on the authority of Mr. Blanford, as having been procured near Poona. Messrs. Davidson and Wender state that it is sparingly scattered over the Deccan in suitable localities. Mr. Ball says that it occasionally occurs in Chota Nagpur, and cites the Rajmehal hills, Manbhum, Singbhum, Sambalpur, Nowagarh, Karial, and the Godaveri valley as localities where he obtained or observed it. From Raipur it is recorded by Mr. Hume. In Furreedpore Mr. Cripps says that it is local in its distribution, dozens being seen in some places and none in others which seem just as suitable. Captain Butler, writing of the Mount-Aboo district and of Guzerat, states that it is uncommon in most parts, but very plentiful in some of the tanks overgrown with reeds and dense beds of bulrushes; and Mr. Hume supplements this by saying that it is common in Sindh and Kattiawar, less so in Kutch, where there are not many localities suited to it, and very rare in Jodhpoor; whilst speaking of Sindh he observes that it is very abundant in the rush-overgrown lakes. Mr. Oates records it as common in the Engmah swamp in Upper Pegu, and as found also at Boulay, but there uncommon. Dr. Armstrong does not note it from the Irrawaddy delta. As regards the province of Tenasserim, Captain Wardlaw Ramsay records it from Tonghoo; and Mr. Davison from Yeaboo and Assoon. It does not appear to extend to the eastward of the Sittang, and is very local in the portions of this district that it does inhabit.

To the southward of this district there seems to be a long stretch of country down the province from which the genus is absent, beyond which it is represented by *P. calvus*, inhabiting the Malay peninsula and the islands of the archipelago.

Habits.—So partial is this species to rush-beds and waters which are overgrown with reeds and impenetrable sedge growth, that it is only found in such spots, not inhabiting (owing solely to an absence of such cover) many places where one would expect to find it. It is again a very sociable bird, being quite gregarious in its habits; and this is another cause which confines it to localities where there is feeding-ground and cover for large numbers of its fellows. In a neglected tank like Topare, through which the floods speedily pass, but leave a large area of shallow water, which in tropical climates speedily becomes a tangled mass of Lotus-reeds, rushes, aquatic plants, and shrubs, the Purple Coot finds a perfect paradise; and dozens may be seen stalking unconcernedly about on the floating leaves and herbage, violently jerking up their tails and showing the conspicuous white under-coverts, keeping all the while well out of shot, and appearing to know that the

swarms of crocodiles lurking about them are the best safeguard against the sportsman wading in within killing distance of them. In spite of crocodiles, however (which in these marshy places belong to the smaller species, *Crocodilus palustris,* which average about 8 to 10 feet in length, and are not dangerous), I have frequently waded for a long time, in search of other and more valuable species, through the haunts of the Blue Coot, and then I observed that he mysteriously disappeared into the surrounding vegetation and remained in concealment until after my retreat. When put on the wing it flies well and swiftly. I have seen one flying round and round the Lotus Pond at Colombo many times before alighting, its long legs stretched out behind him like a Heron's. At the Tamara Kulam, near Trincomalie, the dense rush-growth of which was tenanted by swarms of these Coots, their hiding-place was burnt down once a year by natives, and then they disappeared for some time, making their way probably through the jungle to other haunts in the neighbourhood.

It is chiefly vegetarian in its diet, and is said in India to commit havoc in the rice-fields, concerning which Mr. Cripps states that it cuts the stalks just above the roots and eats the tender pith. I have seen it in grass at some distance from the water, and when disturbed it ran with moderate speed, but with an awkward gait, into the reeds, through which it seemed to force its way without any difficulty. Jerdon styles its note "a fowl-like call," and states that it thrives well in confinement, and has been observed to hold stalks of grain or other food with one of its feet. It is possible that this species may devour the eggs of wild birds; for the European bird, *P. veterum,* remarks Jerdon, "is said to destroy large numbers of wild ducks' eggs by sucking them. One was seen by Canon Tristram to seize a duckling in its huge foot, crush its head and eat the brains, leaving the rest untouched." In this cannibalism it resembles the common Waterhen.

Captain Butler writes concerning its habits in bulrush-beds in Northern Guzerat:—"In such localities I found the bird tolerably tame, and saw them in dozens sitting on the *top* of the bulrushes, allowing one often to pass within an easy shot of them without flying down . . . From the row they make in the rushes, cackling and chasing each other through the water, I fancy they are very pugnacious.

"I remember," he says, "seeing one once take refuge in a babool tree after being driven out of a thick bed of rushes. No sooner had he settled than an Eagle descended into the tree and seized him; the poor Coot cried out piteously, making a noise very like the cries of a domestic fowl when caught to be killed. After waiting a few seconds I approached the tree and the Eagle flew off, dropping the Coot on the ground, which was in a dying state when I picked it up, with a deep wound in the breast, inflicted with the Eagle's claws."

Mr. Hume notices that they have a "flapping, noisy flight, like that of a Peafowl, when flushed out of reed-beds, and that they do not rise more than a few yards in the air." This, however, is not always the case.

Nidification.—In the south-east of Ceylon this bird nests, to my knowledge, in the early part of the year. Mr. Price, of the Public Works' Department, informed me that they nested in the Hambantota district on the borders of swamps and tanks, making a large nest of grass, reeds, and rushes. Two eggs given to me by this gentleman were somewhat of a pyriform shape, and of a stone- or yellow-grey ground-colour, spotted sparingly throughout, one with roundish spots, the other with longitudinal dashes of umber-brown, greyish blue, and purplish brown. They measured respectively 1·9 by 1·38 and 1·9 by 1·34 inch.

From 'Nests and Eggs' I transcribe the following note by Mr. Hume on this bird's nesting in India:—"The Purple Coot breeds all over the plains of India, wherever there are large swamps and jheels with plenty of rush and reed. As a rule, not less than ten pairs breed in the same place. I have invariably in Northern India found the eggs in July and August, never earlier or later; but they are said to have been met with in June and September.

"Two noteworthy points are:—(1st) that all the birds in the same swamp both lay and hatch off at the same time; (2nd) that in two different jheels only a dozen miles apart, and apparently precisely similarly situated, there will be a difference of fifteen days or more in the period of laying of the two colonies . . .

"The nest is made of pieces of rush and reed in amongst thick grass and rice. Sometimes it is on the ground, sometimes, though not free, it is floating. In the latter case the bottom of the cavity will not be above an inch or two from the surface of the water, but there will be a mass of stuff submerged. Ten is the maximum number of eggs that I have as yet found in any nest, and I have repeatedly taken seven or eight

well-incubated ones . . . When fresh the ground-colour varies from a pale pinkish stone-colour to a beautiful pure salmon-pink; but the rosy tint* disappears rapidly." The markings are described as being "rich almost lake-red," mingled with pale purple blotches and clouds. The average of a large number of eggs is 1·93 by 1·39 inch.

* My specimens had been prepared for some considerable time.

GRALLÆ.

Fam. SCOLOPACIDÆ*.

Bill lengthened and slender, flexible and more or less soft; the terminal portion in one group pittuled. Tertials elongated. Tail short. Tibia in all but one genus bare above the knee. Toes usually webbed slightly at the base.

Sternum with a high keel; variable as regards the notches.

Genus RHYNCHÆA.

Bill long, slender, the tip slightly swollen and curved, a long groove in the upper mandible and a shorter one in the lower; nostrils linear, placed near the base and closer to the margin than the culmen. Wings moderate, ample, the 1st and 2nd quills equal and longest; tertials not quite equal to the primaries. Tail short, rather square at the tip; of 14 feathers. Legs moderately long. Tarsus equal to the middle toe with its claw, and shielded with rectangular scales in front. Toes free to the base; outer toe longer than the inner by the length of the claw; hind toe considerably above the rest.

Sexes differing in plumage.

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* N.B.—The Snipes, including the genus *Rhynchœa*, are usually grouped in the subfamily *Scolopacinæ*. It is a question, however, whether the Painted Snipe *strictly* belongs to this group, as the structure of its bill and wing differs from the Snipes; and, in fact, it belongs more to the last family than the present.

RHYNCHÆA CAPENSIS.

(THE PAINTED SNIPE.)

Scolopax capensis, Linn. Syst. Nat. i. p. 246 (1766).
Rallus bengalensis, Linn. Syst. Nat. i. p. 263 (1766).
Rhynchæa orientalis, Horsf. Tr. Linn. Soc. xiii. p. 193 (1821).
Rhynchæa variegata, Vieill. Gal. Ois. ii. p. 109, pl. 240 (1824); Schlegel, Mus. P.-B. *Scolopaces*, p. 16 (1864).
Rhynchæa picta, Gray, Sykes, P. Z. S. 1832, p. 164.
Rhynchæa bengalensis (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 273 (1849); Kelaart, Prodromus, Cat. p. 135 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 266; Jerdon, B. of Ind. iii. p. 677 (1864); Blyth, Ibis, 1867, p. 167; Blanford, Zool. Abyss. p. 432 (1870); Swinhoe, P. Z. S. 1871, p. 408; Holdsw. P. Z. S. 1872, p. 473; Hume, Str. Feath. 1873, p. 235; Salvadori, Ucc. di Borneo, p. 335 (1874); Legge, Ibis, 1874, p. 28; id. J. A. S. (Ceylon Branch) p. 53 (1874); Oates, Str. Feath. 1875, p. 346; Hume, Nests and Eggs, iii. p. 586; Legge, Ibis, 1875, p. 402; Butler & Hume, Str. Feath. 1876, p. 15; Fairbank, *t. c.* p. 263; Butler & Hume, ibid. 1877, p. 223; Wardlaw Ramsay, Ibis, 1877, p. 469; Blakiston & Pryer, Ibis, 1878, p. 225; Hume, Str. Feath. 1878 (B. of Tenass.), p. 459; Davidson & Wender, ibid. 1878, vii. p. 89; Ball, *t. c.* p. 228; Cripps, *t. c.* p. 302; Hume (List Ind. B.), ibid. 1879, p. 112.
Rhynchæa capensis (Linn.), Layard, B. of S. Afr. no. 625 (1867); Shelley, B. of Egypt, p. 250, pl. xi. (1872); Von Heuglin, Orn. N.Ost-Afr. t. ii. p. 1211 (1873); Walden, Trans. Zool. Soc. 1875, ix. p. 235; Barratt, Ibis, 1876, p. 212; Tweeddale, P. Z. S. 1877, p. 551.
Cape Snipe, Latham; *Bécassine du cap de Bonne-Espérance*, *Béc. de Madagascar*, *Béc. de la Chine*, Buffon; *Goldschnepfe* of German authors; *King Snipe*, "*Painter*," Sportsmen in Ceylon. *Pengung*, Java (Horsf.); *Choseh hindi*, Arabic (Von Heugl.); *Tama-shigi* Japan (Blakiston); *Rav-Rav*, Madagascar (E. Newton).
Raja kæswatuwa, *Raja watuwa*, Sinhalese.

Adult male. Length 9·5 to 9·8 inches; wing 5·2 to 5·4; tail 1·5 to 1·6; tarsus 1·7 to 1·8; mid toe and claw 1·65 to 1·75; bill to gape (straight) 1·8 to 1·9.

Iris brown; bill, basal half of upper mandible and all but tip of lower dusky greenish (palest in the female), changing to reddish or livid brown on the remainder; legs and feet sickly green or greenish leaden.

Lores and crown olivaceous blackish, with a buff mesial stripe down to the base of bill, and a broad band of the same behind and passing round the eye; neck behind and on the sides drab-grey, mottled with black, and paling on the fore neck and chest, across which the colour is edged with blackish; a dark stripe below the orbital band; chin, gorge, and lower face whitish buff, passing into the colour of the fore neck; back, lesser tertial coverts, rump, and tail cinereous, with black cross-pencillings and bars and spots of buff-yellow; interscapulars, scapulars, and tertials clouded with greenish black and glossy olivaceous brown, with a purple sheen in some lights, many of the feathers barred and marked with buff, and some of the scapulars with broad central and lateral stripes of buff and white; wing-coverts olivaceous green, barred and spotted with buff, the spots edged with black; quills fine grey, with wavy cross rays of black and some bar-spots of white near the tips of the secondaries, the outer webs spotted with large black-edged ocelli of buff, the interspaces towards the base in the outer primaries being black; breast, lower parts, axillaries, and median under wing-coverts white, passing through the olive and blackish sides of the upper breast in a band, which extends round to the shoulders.

Female. Length 9·8 to 10·0 inches; wing 5·4; tarsus 1·8 to 2·0; bill to gape (straight) 1·9 to 2·1.
(December and June.) Crown and mesial stripe as in the male; orbital circle and streak behind the eye white, with the surrounding dark border blacker than in the male.
Throat, cheeks, fore neck, and centre of hind neck ferruginous, paling to whitish on the chin, and deepening on the chest and sides of breast into olive-black; back and wing-coverts deep olive-green, variegated with black cross rays and ashy bars, the coverts wanting the ocelli and light markings; ground-colour of the primaries darker, and the ocelli not so pale as in the male; breast and lower parts white, passing over the dark sides of the upper breast in a band round to the shoulders, where it is continued down the sides of the interscapular region as a narrow buff line; a tuft of long *pure white lanceolate* feathers beneath the scapulars.

I find no appreciable difference in any of the specimens I have seen killed in both seasons of the year. The amount of rufous at the back of the neck is variable, some examples have more of it than others. As a rule, Ceylonese birds have the hind-neck feathers tipped with brown, which, more or less, according to the amount, obscures the chestnut-colour of the bases.

Young. The nestlings much resemble the male in plumage at first. The back, wing-coverts, and quills in two examples brought to me from the nest were of the same colour, and with the same spots and ocelli, but they had a broad fulvous stripe bordering the scapulars.

Young birds in a more advanced stage before me, from Calcutta, and in the national collection, are plumaged as follows:—the male has the same distribution of markings as the old bird, the feathers of the head, scapulars, and back being merely tipped with white, and the buff markings on the wings are more extensive than in an adult, there being less of the olive-green hue; there is more white about the throat, and the chest is paler, the lower part being fulvous; the coronal stripe is very broad.
The female, which is perhaps a little older and in its second plumage, has the head-feathers tipped with white; the chin white, and the chestnut feathers of the fore neck mingled with whitish ones, while the dark chest-feathers are broadly tipped with the same colour.

Obs. The question has of late years been mooted as to whether the plumage of the female Painted Snipe is not seasonal, and the pale spotted dress donned during non-breeding-time. From personal experience in Ceylon I am unable to furnish any information on the subject, as all female specimens examined by me have been in the dark dress; and as there is no regular breeding-season there, it will be a difficult matter to obtain satisfactory proof of this alleged change of dress without examining an enormous number of specimens. I am inclined to think that the female does assume, at some period, to a great extent, the dress of the male, the neck and chest entirely resembling that of the other sex, but the back remaining very dark. I am supported in this view by the evidence of such an example from Japan in male dress in the British Museum, which possesses the concealed *white lanceolate* scapulars characteristic of the female. The fact of both sexes being attired when young in the male dress is conducive to the opinion in question. In 'Stray Feathers' (*loc. cit.*) Captain Butler notices the fact that nearly all the specimens shot by him in Guzerat were in male dress, 19 *presumed* males having, on one occasion, been shot by him without flushing a single female. No examination appears to have been made; and it is possible that these really were all males, congregated together after the manner of other species in the non-breeding period. Mr. Hume considers that the females lose the chestnut collar in the winter, as examples in his possession, shot in January, only show slight traces of it. There is much yet to be learnt concerning the plumage of this species, but in the meantime it is only reasonable to suppose that the dark plumage of the female is not assumed until the first time it breeds.
Indian examples correspond with Ceylonese in their plumage; females, perhaps, have more rufous-chestnut on the throat and neck than the latter. A female from Malabar measures:—wing 5·5 inches; tarsus 1·7; bill to gape 1·78. It corresponds in general plumage, but is conspicuous for having the face well covered with the black hue. Females from Nepal are similar to the above, and measure:—wing 5·3 to 5·5 inches; tarsus 1·75 to 1·9; bill to gape 1·85.
Examples from China and Formosa measure:—Males: wing 5·0 to 5·2 inches; tarsus 1·5 to 1·7; bill to gape 1·7 to 1·8; they are somewhat paler above than the generality of Ceylonese males, and have the head-stripe very broad.
A Formosan male (?) is much paler above than Ceylonese and Indian specimens; the olive-green colouring is predominated over by the very extensive buff markings, which on the scapulars and tertials take the form of broad bands across both webs; the same golden-buff bars are conspicuous on the tail, and the markings of this colour on the interscapular region are very conspicuous; there is a *white lanceolate feather* beneath the scapulary tuft, which is perhaps a proof that the specimen is a female in male dress. For an examination of this specimen, and

another almost similar to it, I am indebted to my friend Mr. Seebohm; they are in the Swinhoe collection, and measure:—wings 5·15; tarsus 1·6; bill to gape 1·8.

A female (N. Formosa, British Museum) comes pretty close to Ceylonese birds; the black on the lower part of the fore neck is somewhat sharply defined against the rufous. Wing 5·3 inches, tarsus 1·9.

Jerdon unites the African Painted Snipe with the Indian; and in this he is followed by Von Heuglin, Mr. Blanford, and Lord Tweeddale. Mr. Gurney and Captain Shelley likewise recognize them as one. I have examined examples of *R. capensis* from Abyssinia, and do not find that there is any material difference. Swinhoe says that the African birds have the chin bare; but this observation, I imagine, may have been the result of an examination of imperfect specimens. The Abyssinian birds in question, collected by Mr. Blanford, were merely singular in wanting the reddish lustre perceptible in some Asiatic specimens; and this was probably an individual peculiarity, the markings were in all points similar to those of Ceylon birds, and the olivaceous tints the same. Dimensions of a male:—wing 5·2 inches; tarsus 1·6; middle toe 1·3; bill to gape 1·7.

R. australis, Gould, the Australian representative, is very similar in appearance to the present bird; but is entitled to specific rank on account of its *short feet*, and a singular difference in its anatomy, which I have myself observed in a Victorian specimen shot near Melbourne. The trachea passes down between the skin and the muscles for the whole length of the body, and makes four convolutions before entering the lungs. The wing is proportionately longer than in *R. capensis*, and there are slight differences in coloration about the face and back; the inner web of the 1st primary is darker. An example before me measures:—wing 5·5 inches; tarsus 1·5; middle toe 1·3.

The South-American species (*R. semicollaris*, Vieill.) is quite distinct from either of the aforementioned. The female has the entire neck olive-black; the crown black, with the buff mesial stripe; at the sides of the neck next the shoulder is a bar of white, and on the wing-coverts are large round spots of the same; the scapulars have a broad lateral outer border of rich buff. In size also it is much inferior—wing 4·1 inches; tarsus 1·4; bill to gape 1·5; the bill is much curved at the tip.

Distribution.—The Painted Snipe is a permanent resident in the lowlands of Ceylon; but on the west and south coasts there is an increase of its numbers at the commencement of the cool season; and in November, December, and January it is more plentiful in the country west of the Kandyan ranges and in the south of the island than during any other time of the year. Whether this increase is caused merely by an internal migration from the solitudes of the interior, where it may breed, or whether it is the effect of a general increase to the species from the south of India, I am unable with certainty to state; but it is, I think, very probable that there is both a migration to Ceylon during the month of October, and also an internal movement, as is the case with other birds, towards the west coast. It is common in the paddy-fields from Negombo southwards to Galle and Matara about Christmas-time, and I have likewise known it to be pretty numerous about Morotuwa in June. A favourite locality in the south for it is the large stretch of paddy-land lying between Wackwella and Baddegama; and this being the chief resort of Galle sportsmen in the Snipe-season, many "Painters" fall to their guns. I have, however, never known more than three couple killed there at one time, and this was by Mr. Weir, of the P. & O. Service. It is numerous in the Matara district, and I have met with it and found it breeding in the Girawa Pattuwa, near Hatagalla. In suitable localities in the Eastern Province and throughout the northern forests near tanks it is frequently seen; but it wanders about a good deal, and one is not certain of finding it in any particular places, save such large marshes as are to be found at Tamblegam, Minery, and other spots. In the Trincomalie district I observed it oftener in salt marshes than in the Snipe-grounds. It is common in the extreme north, and is a well-known bird in the Jaffna district. Mr. Frank Fisher, of the Ceylon Civil Service, writes me that it affects the paddy-fields and marshes about Chavagacheri in numbers, and that he has shot as many as 5½ couple at one time in that locality. I am not aware to what elevation it ascends; but it most probably visits paddy-fields on the flanks of the Kandyan mountain up to about 1000 feet.

In India Jerdon writes that it "wanders about a good deal according to season, and many will be found in paddy-fields in the south of India in October and November, leading the observer to conclude that they are as migratory as the true Snipe. I have," he remarks, "found them breeding in Malabar, the Deccan, and Bengal." In the Deccan, according to the Rev. Dr. Fairbank, it is a permanent resident; and Mr. Davidson likewise says that it is common there, probably breeding. In Chota Nagpur it is found in suitable localities; and Mr. Ball considers that many remain throughout the year; he records it from Manbhum, Lohardugga, Singbhum, Sirguja, Sambalpur, Jaipur, and the Godaveri valley. Mr. Hume notes it

also from Raipur. Mr. Cripps believes it to be a permanent species in Furreedpore. At the Sambhur Lake it is found in the rains; but in Sindh it is only a cold-season straggler, though in Guzerat it is more plentiful at that time. Captain Butler, who writes of it as common there, says that it arrives at the end of August, and breeds in September and October near Ahmedabad and Erinpoora. Captain Hayes-Lloyd considers it to be a permanent bird in Kattiawar. Turning eastwards I find that it is not recorded as ascending the Himalayas; but in Cachar it is, according to Mr. Inglis, rare; and in Burmah, according to Mr. Oates, it is common. Further south we find it rarer; in the Rangoon district Captain Wardlaw Ramsay has procured it, and at Moulmein it has been shot by Captain Bingham. We have no data of its occurrence in the Malay Peninsula; but it doubtless will be some day added to its avifauna. In Sumatra it was obtained by Sir Stamford Raffles and by Herr S. Müller. In Java it was observed by Horsfield, Boie, Kuhl, and Van Hasselt; and Croockwit has added it to the avifauna of Borneo. It was first obtained in the Philippines by Cuming, but the locality is unknown; recently, however, it was procured in the island of Mindanao at Zamboanga, by the officers of H.M.S. 'Challenger.' Returning towards the continent we find Swinhoe recording it from Hainan and from Formosa, in the latter of which islands it was tolerably common. He obtained it at Amoy, and notes in his Catalogue (P. Z. S. 1871) that it is found throughout China in the summer. In the Japanese islands it breeds on Fujisan, as noticed by Messrs. Blakiston and Pryer, and is also found at Tokio and at Yokohama. Von Siebold also procured it in Japan. Prjevalsky met with it in S.E. Mongolia, and found it breeding at Lake Tsaidemin-nor.

I find no statement of it inhabiting Western Asia save that of Antinori that it occurs in Asia Minor; but in uniting the African species with it, we find the Painted Snipe common in portions of Northern Africa, whence Messrs. Shelley, Taylor, and Gurney have recorded it. In the 'Birds of Egypt' the former gentleman writes, "This species ranges throughout Egypt and Nubia, and is not uncommon at times in the Delta and the Fayoom, where it may occasionally be met with in flocks, though more often singly. It remains in the country throughout the year, and breeds in May." Both sexes, especially the female, are very well figured in Captain Shelley's excellent plate. In West Abyssinia Von Heuglin obtained it in February, and he remarks that it is very common in Lower Egypt; in the coast districts Mr. Blanford got it, and Brehm and Vierthaler observed it on the Blue Nile in December. Von Heuglin also found it breeding in May in the Abuzabel district. Following it down the east coast, we find it recorded from Mozambique and also from Madagascar. In the latter island Mr. E. Newton records it as met with by him from Andoviranto on the east coast to Ambohitroni, and also at Soamandrikazay; and Dr. S. Roch procured it at Farafata. Mr. Ayres speaks of its occurrence in the Transvaal; and Mr. Barratt obtained it near Potchefstroom. In Cape Colony Layard procured it; and Andersson added it to the birds of Damara Land. In Western Africa it was obtained by Hartlaub; and I find it recorded by Von Heuglin from Senegal, Bissao, Gaboon, Gambia, Benguela, and Angola, which widely-separated localities, as will be seen by a glance at the map, give it a vast range on the west coast of the continent.

Habits.—This very interesting species resembles in its mode of life and habits the Rails more than the Snipes, and, indeed, may be considered to form a link between the two families. It is particularly fond of rushy and reedy marshes, but is found in paddy-fields as well; and it generally selects a somewhat secluded locality, such as the corner of a large swamp or paddy-field, in which several individuals, but more often a pair, will be found, while for miles round not another individual will be met with. As a rule, it is found not far from water—that is, if there be any ponds, ditches, or wet places in the fields which it frequents. It is very often flushed singly, but in reality associates, as a rule, in pairs, one bird of which is frequently passed over, as it lies very close and will not rise until nearly trodden upon. It then flies straight away, with rather slow flappings of its ample wings, and suddenly drops, like a Jack Snipe, into the grass. It is frequently missed by good shots when, after banging away at quick-flying Snipe, they unexpectedly flush one of these birds and do not allow for its much slower flight. It not uncommonly enters the water when winged, and swims well. Mr. Fisher writes me, "When walking up wounded and unwounded birds I have seen these Snipe take to the water and swim several yards across to ground further on, in their endeavours to hide themselves." Mr. Young, of the Survey Department, likewise tells me that he once saw two young birds swimming across a pond after their parents were flushed, with the hen bird flying round them in a great state of alarm.

The Painted Snipe feeds much on very small Mollusca. I once found a number of good-sized univalve shells in the stomach of an individual which I shot in a salt marsh; and on other occasions I have detected minute snails in its gizzard. Like the true Snipes, I imagine that it searches for its food to a great extent at night, lying quiet in the daytime. Mr. Ball remarks that he has frequently flushed them from under the "shelter of *Tamarix* bushes in the beds of rivers." In Formosa and China Swinhoe seems to have observed this bird chiefly in marshy places; and we learn but little from his notes concerning its economy, except that he found its food to consist of Crustacea.

That exceedingly observant naturalist, Von Heuglin, however, appears to have closely investigated its habits while he was in Northern Africa; and the result of his observations tends to show its affinities with the last family of birds. He remarks that in Lower Egypt, though it is common, it is not often seen, on account of its nocturnal habits and propensity for concealing itself; it there affects the thickest sedge, long grass, rice-fields, the borders of lagoons, small ponds, brooks, and the edges of muddy overgrown dykes. Like the Rails, to which he observes it bears a resemblance in its actions, it is with difficulty flushed during the heat of the day, and can be more easily found on moonlight nights, or with the help of a pointer, when it will allow itself to be taken by hand. If surprised in an open spot, it escapes into the nearest thicket, and there remains motionless. Its flight is likened to that of the Land-Rail as being more laboured and fluttering, and suddenly terminated after from 10 to 20 paces by the bird dropping into the grass, giving one the impression that it had suddenly lost the power of flight.

It is, in general, entirely silent. I have never once heard it give vent to a note on being flushed; Brehm, however, likens its voice in the spring to a rather loud dissyllabic cry resembling *nāeki, nāeki*.

I find the following note, contributed some years ago to 'Nests and Eggs' (*l. c.*), on a nestling which I had in my possession at Galle, and which was very quaint in its actions:—"It lived but two days, and was confined in my back yard, where it used to run about, hiding behind tubs, chatties, and such articles; when tired, it used to rest its head by placing the point of its bill on the ground, after the manner of the *Apteryx*; when pursued it would spread out its wings and squat on the ground, and then run a little distance, crouching down again." Blyth remarks that the young "with feathers half-grown spread the wings and tail, displaying their beautiful markings, and try to look fierce at the beholder." He has likewise noticed that when surprised the adult "has the habit of spreading out its wings and tail, and so forming a sort of radiated disk, which shows off its spotted markings, menacing the while with a hissing sound and contracted neck, and then suddenly darting off."

Nidification.—The Painted Snipe either has two broods in the year, or else it breeds indiscriminately at all seasons. It may be said, however, as a rule, that more nests are found, young captured, and eggs taken from dead birds between November and May than at the opposite season of the year. I have seen an egg taken from a specimen at Galle in March, young captured at Wackwella in September, and know that nestlings have been seen in May at Oodogamma. In the Colombo district eggs have been procured in April, and young found by Mr. MacVicar in February. Mr. Holdsworth mentions the fact of a wounded bird laying an egg in a basket in which it was confined on the 31st December; but at this time of the year I have killed birds in the north of Ceylon which showed no signs of breeding.

Layard states that the season of nidification is from May till July; but this observation is perhaps based upon a single occurrence. I myself shot a female which had evidently risen from the nest, in July, in the Hambantota district; but I do not think, as I have just remarked, that as many birds lay then as during the cooler months. The nest is placed upon the bund of a paddy-field or in swamp-grass and rushes, and is made of grass and rush-blades. Layard says it consists of a slight depression in the soil, lined with a few tufts of grass. I have never seen one myself; but as regards its shape and size I find that Mr. Hume describes one which Mr. A. J. Rainey sent him from Khalispoor, in Jessore, as a large circular pad of mingled coarse and fine rice-straw, some 6 inches diameter and about 1·75 in thickness, and with a central depression of about $\frac{3}{4}$ inch in depth. The number of eggs laid in Ceylon seems usually to be four. They are of a beautiful stone-yellow ground, very boldly marked with widely-separated blotches or clouds of brownish black or very deep sepia, beneath which lie bluish-grey and light-brown blots in some eggs, while others are streaked with black lines among the clouds. Some eggs are chiefly marked at the large end, while others have the blotches

evenly distributed. But the *character* of the egg consists in the proportionately large size of the markings; it is pyriform in shape and very small, compared with those of most Waders. An example in my collection measures 1·36 inch in length by 0·98 in breadth.

In India it has been found breeding in September and also in December. In the former month its eggs have been taken in Jessore and in Raipur, and in the latter at Chamrajnugger, in the Mysore district. Mr. Hume remarks that the markings often cover half the egg; the average size of ten he gives as 1·4 by 1·01 inch.

Genus SCOLOPAX.

Bill long, straight, slender, soft; extreme tip decurved, and the extremity of the lower mandible fitting against this portion; both mandibles channelled, the lower only to the middle; nostrils linear, placed near the base; gape in advance of the base of the culmen. Wings long; the quills curved, the 1st the longest. Tertials rounded at the tip. Tail short, of 12 feathers, cuneate at the tip. Legs short. *Tibia feathered to the knee.* Tarsus equal to the middle toe, covered with transverse scales in front. Toes free to the base, the lateral ones equal; claws very short; hind claw not projecting beyond the toe.

Eye very large and placed far back. Ear-conch enormous.

SCOLOPAX RUSTICULA*.

(THE WOODCOCK.)

Scolopax rusticola, Linn. Syst. Nat. i. p. 243 (1766); Gould, B. of Eur. iv. pl. 319 (1837); Blyth, Cat. B. Mus. A. S. B. p. 271 (1849); Kelaart, Prodromus, Cat. p. 135 (1852); Middendorff, Sibir. Reise, p. 223 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 266; Jerdon, B. of Ind. iii. p. 670 (1864); More, Ibis, 1865, p. 437; Godman, Ibis, 1866, p. 101; Shelley, B. of Egypt, p. 247 (1872); Legge, J. A. S. (Ceylon Branch) p. 64 (1873); Gould, B. of Gt. Brit. iv. pl. 77 (1873); Hancock, B. of Northumb. p. 102 (1874); Anderson, Str. Feath. 1875, p. 356; Blanford, Zool. Persia, p. 782 (1876); Fairbank, Str. Feath. 1877, p. 409; Butler, *t. c.* p. 504; Dresser, B. of Europe, pt. 61, 62 (1877); Blakiston & Pryer, Ibis, 1878, p. 221; Hume, Str. Feath. 1878 (B. of Tenass.), p. 458; Ball, ibid. 1878, vii. p. 228; Hume, ibid. 1879 (List Ind. B.), p. 112.

Scolopax rusticula, Linn.; Swinhoe, P. Z. S. 1871, p. 407; Holdsw. P. Z. S. 1872, p. 472; Schelgel, Mus. P.-B. *Scolopaces*, p. 2 (1864); Von Heuglin, Orn. N.Ost-Afr. p. 1208 (1873); David & Oustalet, Ois. de la Chine, p. 473 (1877); Seebohm, Ibis, 1879, p. 26; Wharton, *t. c.* p. 454.

Scolopax indicus, Hodgs. Journ. As. Soc. B. vi. p. 490 (1837).

La Bécasse, Buff. Hist. Nat. Ois.; *Waldschnepfe*, German; *Houtsnip*, *Woudsnep*, Dutch; *Gallinhola*, Portuguese; *Gallineta*, Andalucia; *Chocha*, Spanish; *Sou-mirh*, Morocco (Drake); *Himar el hedjel*, lit. "the Donkey of the Partridge," Moorish (Irby). *Szalonka*, Transyl. (Danford); *Hodo-shigi*, Japanese (Blakiston); *Yelfi*, Asia Minor (Danford); *Sim-titar*, *Tutatar*, Hind.; *Sim-kukra*, Kumaon (Jerdon).

Adult male, very fat (Wales, November). Length 13·9 inches; wing 8·0, expanse 24·5; tail 3·6; tarsus 1·46; middle toe 1·46; bill at front 2·93. Weight $12\frac{1}{4}$ oz.

Adult, presumed female (Bhootan). Length 14·25 inches; wing 8·0; tail 3·3; tarsus 1·41; middle toe 1·41; hind toe 0·43; bill at front 3·27.

Female (shot from the nest, Himalayas). "Length 13·2 inches; wing 7·5; tail from vent 3·3; tarsus 1·5; bill 3·3." (*Anderson*.)

Male in course of migration, "not fat, but in fair condition" (Karachi). "Length $13\frac{5}{8}$ inches; wing $7\frac{3}{4}$; tail $3\frac{1}{4}$; bill at front 3·0; expanse 24·0. Weight 8 oz. 9 dwts." (*Butler*.)

Presumed male, excessively fat (Wales). Wing 8·0 inches; tail 3·5; tarsus 1·45. Weight $14\frac{1}{2}$ oz.

Adult female, December (Wales). Length 13·8 inches; wing 7·8; bill at front 3·0. Weight $11\frac{1}{4}$ oz. The bill is larger in the female than the male.

Obs. The enormous variation in the weight of the Woodcock is entirely dependent on the condition of the individual, as I have endeavoured to show by the above data. It becomes so fat that the entire body is encased in an unbroken coat of grease, and it then of course reaches its maximum weight. Jerdon gives the average as 9 to 10 oz., and the extreme range 7 to 14 oz. or more.

* Mr. Wharton (*loc. cit.*) clearly demonstrates that *rusticula* is the correct orthography, it being the Latin in classical times for some kind of Partridge or Grouse. *Rusticola* is a meaningless word.

The following are data of the only two Ceylonese examples that have been, so far as I am aware, preserved :—
(*a*) *Adult* (sex ?: Nuwara Eliya, Jan. 1872). Wing 8·0 inches ; tarsus 1·4 ; bill at front 3·15. (*b*) *Female* (Hakgala, Feb. 1877). Length 14·0 inches ; expanse 26·0 : weight 10 oz.

Iris dark brown ; bill slightly brownish at the base, from that fleshy, then darkening to blackish at the tip ; legs and feet greenish grey, brownish on the toes (British example in flesh).

(*a*) Lores, chin, and forehead fulvous grey, tinged with brown ; top of head and occiput rich blackish sepia, barred with two narrow bands of rich fulvous tawny ; a darkish line down the forehead to base of bill, and a broad stripe through the lores from the gape to the eye ; general aspect of plumage above dark sepia-brown and ferruginous, the wing-coverts and back being barred with rich rusty, and the scapulars, interscapulary region, lower hind neck, and tertials mottled marginally and indented with it ; the upper back and scapulars are also tipped and crossed with rich buff, mostly on the outer webs, the dark portions being sepia-black like the head ; lower back and rump barred narrowly with black and ferruginous alternately ; the upper tail-coverts more rufous than the rump, and the bars mottled and more wavy, some of the feathers tipped with grey ; lower wing-coverts blackish brown, barred with ferruginous, which predominates at the tips ; greater wing-coverts barred chiefly with buff ; quills and primary-coverts dark hair-brown, barred with ferruginous on all but the first two primaries, and indented with buff at the inner margins ; the first primary is edged with white, this colour indenting the brown near the shaft, the second is indented with buff ; tail black, with ferruginous indentations on the outer webs, and the tips, for nearly half an inch, brownish grey above and silvery white beneath.
Beneath fulvous tawny ; chin whitish and the throat barred with brown, the lower part of the face striped with the same ; the chest and breast narrowly barred with brown, the bars on the flanks bolder than elsewhere ; under tail-coverts with central brown marks and cross bars ; axillaries brown, banded with fulvous buff ; under wing-coverts buff, barred narrowly with brown ; the greater series brown, barred with pale buffy.
The above description of the Nuwara-Eliya specimen, now in the possession of Mr. Holdsworth, was taken before the skin was made up, when it was in a rough state, and is not as exhaustive as it might be ; yet I prefer to give precedence to it as being a Ceylon-killed bird. The Hakgala example I have not examined.
Albinos are occasionally met with. Messrs. Blakiston and Pryer speak of a specimen all creamy white, obtained at Kawasaki in Japan, and now in the Milan Museum.

Young (chick, Azores). Crown, hind neck, and centre of the back dark brown-maroon, deepening into black at the forehead, and with a stripe of the same through the lores, above which, and across the crown, are stripes of buff ; rest of the body above ferruginous, patched and otherwise marked with buff ; under surface rufous-buff, variegated at the sides of the throat with brownish rufous. The nestling at this age is very handsome.
Bill black, yellowish at the base, measuring at front 0·6 inch.

Nestling (about 5 weeks old : British Museum). Has much the same character of marking as an old bird. The crown is black, the feathers with rufous bases ; down the hind neck is a rufous band bounded on each side by a white one ; the back and wings are rufous, barred with black and patched with fulvous ; wings much as in the adult ; fore neck and under surface buff, with wavy transverse bars of black, and with a wash of rufous on the sides of the chest.

Yearling birds have the under surface devoid of the buff hue, the colour being dusky white ; the under tail-coverts are the same instead of being rich buff, and are barred throughout from base to tips with brown, and not marked with handsome pointed stripes, as in the adult ; the outer web of the 1st primary has a white *edge*, but next the shaft it is brown, *indented with the white of the margin.*

Obs. There seems to be little variation, *dependent on locality*, in the plumage of the Woodcock throughout its widely extended habitat ; but examples from the Atlantic isles, where it is a resident species, are smaller than continental birds. A Madeira skin, ♂, in the national collection measures—wing 7·5 inches, bill to gape 2·42, tarsus 1·3 ; another ♂, from the Azores, measures—wing 6·9 inches, bill to gape 2·5, tarsus 1·2.
Individual variations are noticeable in examples from the same locality or country, and are chiefly dependent on age. Some birds are very dark, notably Indian and Eastern-Asiatic specimens ; others are lightly and richly coloured. In some the cheeks are darkly striped, and in some there is a coalescing of bold dark markings across the throat, forming an irregular band. The marking of the outer web of the first primary varies much, and was formerly considered to be a sexual sign : the deeply indented white border is unquestionably a mark of nonage, and is most noticeable in birds with barred under tail-coverts ; but it exists in many manifestly adult birds, while in other skins in the like plumage there is either a plain white border at the base or nearly all along the quill to

the tip; and the latter are probably the older examples. The *plain* white border exists irrespective of sex, although I am inclined to think that it is more highly developed in females than in the other sex.

The little American Woodcock, *Scolopax minor*, in which the wing measures 5·0 inches and the bill at front 2·4 to 2·5, differs chiefly in having a plain under surface, which is dusky buff, and rufous on the flanks; the occiput and nape are black with two bands, as in the present species. *Scolopax saturata*, Horsfield, is a Javan species and very rare, and in size it is intermediate; "the breast and abdomen are sooty black, with irregular dusky bands." The wing in a specimen in the Leyden Museum measures 5·8, bill in front 3·0. *S. rochussenii*, the king of the genus, is another very local species from Ternate—black above, buff beneath, and beautifully marked with the same above. An example in Mr. Harting's collection measures—wing 8·0 inches, bill 3·7.

Distribution.—The Woodcock has long been said to be an occasional visitor to the hills of Ceylon, but until lately no specimen had ever been preserved. Kelaart first noticed its occurrence as follows:—"The Woodcock, the same as the European species, is found on Horton Plains, and occasionally at Nuwara Eliya. We have not seen the bird in its feathers, but we have seen a couple of birds called 'Woodcocks' at a dinner-table which tasted uncommonly like the birds of that name. We have no doubt of its existence in the island, as several English sportsmen assured us of their having shot it." Layard, who did not collect in the upper hills, had no opportunity of meeting with it; and Mr. Holdsworth, who spent much time at Nuwara Eliya while he was in the island, never came across it. In February 1876 a well-known Ceylon sportsman, Mr. Frank Fisher, of the Civil Service, shot a fine example at Nuwara Eliya, news of which reached Mr. Holdsworth in time for insertion in his catalogue. This bird was fortunately preserved, and is the subject of the above description. In January 1877 a second specimen was shot in the Hakgala Gardens by the superintendent, Mr. Thwaites. It frequented the locality for some little time previous to its being killed, and appeared to have taken up its quarters there.

It is not improbable that a few birds stray over to Ceylon every year from the hills of Southern India, but they escape notice owing to the jungly nature of the country. I worked the ground at Horton Plains thoroughly at the same time that the last-named bird was shot, but saw no sign of a Woodcock. It should be looked for from November until February.

In India the Woodcock is a migrant of only local distribution. Jerdon gives us the most complete note concerning it yet published, which is as follows:—"The Woodcock is a winter visitant to the more elevated wooded regions of India, the Himalayas, the Nilghiris, the Pulneys, Shervaroys, Coorg, and doubtless all the higher ranges of Southern India. During its periodical migrations individuals are occasionally killed in various parts of the country. Several were procured in the Calcutta market by Blyth. I have heard of its having been at least once obtained in the Madras market; and various other instances of its having been procured in different parts of the country have come to my knowledge, viz. at Chittagong, Berhampore, Noacolly, Tipperah, Dacca, Masulipatam, &c. The Woodcock is late in arriving, generally not appearing before the middle of October, and usually later; it leaves in February." Scarcely any data concerning its occurrence in Southern India, of late years, is to hand. The Rev. Dr. Fairbank is the sole writer who notices it in 'Stray Feathers,' and remarks:—"I flushed a Woodcock in the Kodaikánal in 1867. Afterwards one was obtained there by Mr. Levinge; but they are certainly rare in the Palanis." These are the most southerly ranges in the Peninsula, save the Travancore hills; and as they are so rare in them it is not likely that they would be plentiful in Ceylon. On the southern slopes of the Himalayas it is a resident bird, breeding there in many localities. Mr. Brooks met with one in the valley of the Bhagarati; and my late friend, Mr. A. Anderson, found a nest with four eggs at 10,000 feet elevation, near Namick, in Upper Kumaon. Mr. Wilson (better known as "Mountaineer") likewise obtained its nest at Gangaotri, and Captain Duff at Kullu (*Hume*). Captain Butler procured it in Sindh, about two miles from Karachi, in November 1877, and he records the fact of Mr. James meeting with it in the North-Canara jungles. Two individuals were also killed by Col. W. Peyton and Mr. J. S. Laird in December 1877, near Belgaum. These stray birds are picked up during their migration; and Mr. Hume remarks that there is scarcely a district in India from which he has not some record of their occurrence, and that at such unlikely places as Allyghur, Booludshur, Agra, Cawnpore, &c. single individuals have occurred. Mr. Ball records it from Raipur. On the Burmah side of the Bay it is rare. Col. Brown procured one at Moulmein; and Mr. H. B. Davidson, superintendent of police, shot one near Rangoon and another near Tavoy in Tenasserim. Mr. Hume, who notes these

occurrences, likewise records the shooting of one by Mr. J. C. Davis at Thatone. From the Malay peninsula it has not been recorded, so that in this direction Tenasserim is its southernmost limit.

In China it is, according to Swinhoe, found throughout the country in winter; and I notice that he records it from Cheefoo as late as the 30th April. He does not appear to have noticed it at Hainan or Formosa. Messrs. Blakiston and Pryer say that it is common at Tokio and South Japan in winter, and that it migrates north to Yezo in the spring. Mr. Whitely procured it at Hakodadi.

The majority of the birds found in India in the cold season are no doubt arrivals from northern climes, as it can only breed in limited numbers in the Himalayas. We find that Severtzoff remarks upon it as a bird of passage only in Turkestan; but at Kashgar Stoliczka noticed it in November and December, after which latter month it disappeared. In Persia it is a winter visitant, the rose-gardens there being, according to Major St. John, its favourite haunt. Mr. Blanford likewise says it is common in gardens in that country. In Palestine Canon Tristram met with it; and in Asia Minor Mr. Danford says it is generally distributed in the mountains in the winter.

Mr. Dresser thus sketches out its distribution in Northern and Central Asia:—"In Siberia it is known as a summer visitant; and Dr. Dybowski states that it breeds in the Baikal Mountains, and remains until September. Von Middendorff met with it in the Stanowoi Mountains nearly to the summit, and observed it passing there between the 2nd May and 1st of June. Von Schrenck does not record it; but Dr. G. Radde says that after sunset he frequently saw it passing in the woods between the Bystraja brooks and the water-shed of the streams on the south-east corner of Lake Baikal." Col. Prjevalsky observed it in the Muni-ul mountains in Mongolia, and says that it breeds in the Ussuri country. In the valley of the Yenesay Mr. Seebohm did not meet with it, owing probably to the country not being suited to its habits, for both to the east and west of that region it ranges far to the north.

It is a winter resident in the Mediterranean and in the south of Europe generally, but its numbers, as is the case in Great Britain, vary according to the weather which prevails each season. The Albanian coast is proverbial for the excellent Woodcock-shooting which it affords; and in Thessaly and Macedonia, Messrs. Elwes and Buckley write that very good sport may be had in some seasons. Mr. A. B. Brooke, writing in 'The Ibis,' 1873, remarks that it was more numerous in Sardinia formerly than at that time. In Corsica Mr. Bygrave Wharton did not find it common in 1875 on the west coast; but he remarks that it was said to be more abundant on the eastern side. Mr. Saunders speaks of it as common in the south of Spain; and writing of the Gibraltar district Col. Irby remarks as follows:—"Uncertain, both in numbers and as to time of arrival near Gibraltar, in some seasons Woodcocks are tolerably plentiful, as in 1873; in others, as in the winter of 1871-72, they are very scarce." He further observes:—"My earliest note of the arrival of a Woodcock about Gibraltar was on the 17th October, but very few arrive until the middle of November. The latest noticed was on the 8th of March; but I have seen them in Seville market on the 22nd of that month."

Von Heuglin gives the limit of its normal breeding-grounds between 42° north lat. and the polar circle in Europe. In Transylvania they are, write Messrs. Danford and Harvie Brown, generally common, arriving from the south in March and April, and after staying a short time in the low country they proceed into the mountains to breed. As is well known to many people in England, the Woodcock breeds in nearly every county, a favourite resort in the extreme south being the New Forest. In Scotland it is much more common, and in the nesting-season numbers breed in Rosshire and Sutherlandshire, Mr. More citing Perthshire as the district down to which it nests regularly. It is a question what becomes of the Woodcocks bred in England in the spring, as they are not seen in the summer and early autumn. The natural inference would be that, as it is a migrant, nesting, as a rule, in countries south of where it is bred, our English birds must migrate to southern parts after the young are flown. I am not aware, however, that any summer birds are ever seen on passage in any part of Western Europe; and we must either believe that they are all killed off in England or move northwards at night towards Norway and Sweden, to which country they could easily escape without being noticed. In Scandinavia it is very abundant during the breeding-season, and very many breed in Finland. It has been observed as far north as Tromsö, and is known to have strayed across to the Faroe Islands.

Lastly, looking to Africa, we find Favier, as quoted by Col. Irby, stating that the Woodcock is not abundant round Tangier, arriving during November and departing in March. Mr. Tyrwhitt Drake, however,

says that it is common in Morocco in winter. In Egypt, according to Captain Shelley, it is only a straggler; he mentions the occurrence of one individual in the Delta of the Nile. It is, however, evidently more numerous at some seasons than others; for Von Heuglin met with it in March in overgrown gardens near Alexandria and Rosetta, and also in the neighbourhood of Cairo, where it frequents vegetable-fields which are intersected with dykes and watercourses. In North-eastern Africa he never observed it. According to Naumann it has been met with in Senegambia and on the Gold Coast. In Madeira and the Canaries it is, according to Mr. Godman, a resident, breeding in all the islands sparingly, and inhabiting high wooded ravines. This gentleman likewise records it as stationary in the Azores, being not uncommon throughout the group, and most abundant in St. George's, Pico, and Flores, where it breeds in March.

It is interesting to know that it has strayed on two occasions across the Atlantic. On the 9th January, 1862, one was killed in Newfoundland; and Mr. G. N. Lawrence speaks of another specimen which was bought in a market as far back as 1859, and was believed to have been killed near Shrewsbury, New Jersey. It has, notwithstanding, never been recorded from either Greenland or Iceland.

Habits.—In India the wooded ranges of the south of the peninsula and the slopes of the Himalayas abound with spots which the Woodcock delights in—damp nullahs drained by numerous streams, which now and then in their course create little marshy spots, overgrown with rank vegetation and thorny shrubs, or on the sides of which moist soil furnishes good "boring"-ground; here and on the outskirts of woods, particularly where the soil is spongy and holds plenty of cover, they are to be found. But though they delight in such secluded ravines and feed on the borders of sylvan streams, they may be found in the daytime, when they are not feeding, in woods on the sides of hills, and in plantations far removed from water. In northern countries they are partial to sheltered larch- and spruce-woods and to thick "oak cover," such as may be seen clothing the sides of narrow valleys in Cornwall, than which there is no better situation for the Woodcock to be found in England. They like woods where the soil is soft and free, and in which, though they are not on the alert for food, they can, during their time of repose, now and then indulge in a "bore."

At sunset they sally forth from their hiding-places, no doubt wandering over a large area of country during the night in search of suitable spots to feed in; and when localities are found containing an abundance of food they naturally remain in them after dawn and continue to feed during the morning. The eye of the Woodcock is eminently suited for its nocturnal habits; it is enormous, the orbital cavities occupying two thirds of the whole skull and leaving but a small cranial space, so that in the dead bird what appears to be all head is, for the most part, eye. The Woodcock is an unsociable bird; it lives apart from its kind, is almost always flushed singly; and when a number are found in one wood together, the cause of their union lies in local abundance of food, and not in any social propensities, as will appear from their being found in only scattered company. Their chief food consists of worms, of which they are said to eat enormous quantities; and the assertion of Montagu that it would be constant labour for one person to procure food for two or three Woodcocks is corroborated by Mr. Hancock, who writes, in his 'Catalogue of the Birds of Northumberland,' of a gentleman who reared three, the supplying of which with worms constantly occupied one man. I have myself found small coleopterous insects in the stomach of this bird, mixed with vegetable matter, which appears to form itself into hard globular masses previous to ejection, having somewhat the appearance of Owl-castings.

The Woodcock is in general a silent species; but during the breeding-season it makes, while on the wing, a singular note, which Mr. Hancock likens to a "shrill chirp, produced twice, or rather a sort of squeak, like that made with a corkscrew when entering the cork—a noise to set the teeth on edge." Another noise, which is likewise made on the wing, this naturalist calls a kind of croaking, of no long duration, but repeated at intervals. He writes as follows concerning these interesting sounds:—"On one occasion, in Norway, we heard them most distinctly, the Woodcocks all the time flying to and fro in the twilight, about 10 o'clock, P.M., over the tops of the trees of the wood where they were nesting. On another occasion we heard them with equal distinctness near Dunrobin, Sutherlandshire; this was the 19th of May, 1849, and likewise in the evening, the birds all the while flying backwards and forwards over the tops of the trees, not far from the spot where we found a nest. Unfortunately on neither occasion had we a sufficiently clear view of the birds to see if the croaking sound was accompanied by any quivering motion of the wings. Therefore I can

only conjecture how it is produced; but from the character of the sound itself it is certainly akin to that made by the Snipe."

The great depth of the sternal keel and consequent size of the pectoral muscles, together with the size of the head, render the Woodcock a heavy bird; and on the ground it is by no means agile as compared with other members of the Scolopacidæ. It stands with the breast somewhat drooping, owing to its structure, combined with the rather backward position of the legs; and when it runs it proceeds with a waddling gait, resembling that of a Duck, getting, however, over the ground with no little speed when it has been winged and is pursued. It has been contended (and much has been written on the subject in the 'Field' newspaper) that it "rises from its bill," employing it as a lever against the ground at the moment of its taking flight. This may be so; but I imagine it is an optical illusion, which can be accounted for when we consider that rising suddenly from a state of rest, as is its habit, its heavy body and head and the shortness and backward position of its legs would naturally combine together to cause the whole frame to dip forward when the wings are quickly uplifted; and as the normal position of the bill is pointing downwards, the tip would almost touch the ground were the head jerked forwards. By carefully examining the ground at the spot from which a bird rose the impression of the tip of the bill could be discovered were this expedient really resorted to by the bird, and thus the matter would be settled. I am not aware whether this has ever been done. When Woodcocks are flushed on the side of a hill they almost invariably fly down the slope; their flight is moderately quick, somewhat irregular, and performed with heavy flappings of the pinions, between which there is often a perceptible interval longer than the rest. When suddenly surprised the Woodcock sometimes resorts to a singular expedient of concealment. It squats on the ground, and throwing back its head erects its bill quite perpendicularly, so that it looks like a short stick. A friend of mine, who once caught sight of one in this position when snow was lying in the cover, informs me that it was most difficult to distinguish it from the surrounding objects as it squatted on the snow with its bill erect and completely motionless.

In former days Woodcocks were caught in numbers in snares: the following paragraph in Montagu's 'Dictionary' relates to the method of their capture:—"Springers are usually set in moist places on the verge of woods, especially where the fowler perceives perforations made by the bill of the Woodcock, termed borings. . . . . In such places a common ground-spring is formed of an elastic stick, to which is fastened a horsehair noose, which is put through a hole in a peg fastened into the ground, to which a trigger is annexed; and in order to compel the Woodcock to walk into the trap an extended fence is made on each side by small sticks set up close enough to prevent the bird passing between; these concentre at the trap, so that in this funnel-shaped fence the Woodcock on feeding is compelled to pass through the narrow passage, and is almost to a certainty caught by the legs."

In the north of England, where the Woodcocks resort to moist places in the open fells to feed, it is a common practice with fowlers to build a little wall or row of stones, about 10 inches in height, across or alongside some ascertained feeding-place; and in this wall a narrow opening is left in which a horsehair noose is placed, of the same description as that above described. When the Woodcock, in walking about in search of its food, comes to the wall it runs along it until it finds the opening, through which it invariably passes, and is secured by the legs in the noose set for it. Mr. Seebohm informs me that the Ost'-yāks adopt precisely the same method of catching Sandpipers on the Yenesay, making their "walls" of drift-wood or any substance they can lay hands on. In the west of England it is caught in glade-nets, which are spread across narrow glades, down which it flies on coming out into the open to feed.

One of the most interesting habits of this beautiful bird is the practice of flying backwards and forwards in the breeding-season over a particular line of country in the evening and morning before going to and returning from its feeding-grounds. This is called "rôding;" and during it is on the wing it utters its peculiar notes. A Scandinavian author, Mr. Ekström, has written an interesting account of this habit, extracts from which are given in Mr. Lloyd's work on the game-birds of Scandinavia, and portions of which I here subjoin:—"During its morning and evening flights at this time, the Woodcock gives utterance to a peculiar call-note, which sportsmen express by *knort, knort, knisp,* or more properly, perhaps, by *orrt, orrt, pisp.* The first, *knort* or *orrt,* is a hollow, coarse, and somewhat lengthened nasal sound; the second, *knisp* or *pisp,* a short,

fine, and sharp sort of whistle, which, when one is accustomed to it, may be heard at a considerable distance. This note clearly appears to be one by which the betrothed invite each other to pairing; for the bird seems to pay very little attention to the *orrt*, but always listens and looks about it as soon as it hears the *pisp*. When two Woodcocks whilst rôding meet, or come into near proximity, they chase each other; and whilst casting themselves with the rapidity of lightning amongst the trees and bushes, even to the very ground, they give quick and hurried utterance to their finer note *pisp*."

The line of country over which the Woodcock rôdes is termed the *drag* in Swedish; and by taking up a favourable position in one of these *drags* numbers of birds are shot by Scandinavian sportsmen. When the weather is raw and cold, with a drizzling rain, the Woodcock is said by Mr. Ekström to rôde best; and concerning the above mode of killing them he writes:—"During the first days of spring the Woodcock commences rôding the instant the sun has sunk below the horizon, but at a more advanced period somewhat before its total disappearance, and continues until nightfall. In the morning it begins rôding whilst still quite dark, and ceases previous to its being full daylight. When the bird rôdes there is always an interval between each *tour* and *retour*, which is more observable in the evening, when it goes and returns three times. The first time it always flies high, and generally with rapidity; the second, its flight is but little above the tree-tops, and commonly slower; the third time still nearer the ground, and yet more leisurely; but it is then, especially in early spring, too dark to take proper aim. One ought, therefore, always to fire when it makes its appearance for the second time."

The migration of the Woodcock takes place at night; and Selby noticed that most birds arrive in misty calm nights, a fact which subsequent observation is said fully to bear out.

Nidification.—This bird breeds only in the Himalayas within the Indian limits. It has been observed "rôding" in Sikhim; and my late friend, Mr. A. Anderson, found its nest in the upper valleys of Kumaon at an elevation of about 10,000 feet, and was fortunate enough to secure the eggs, almost the only specimens ever preserved in India. From his interesting notes on the occurrence, contained in 'Stray Feathers,' 1875, I transcribe the following passage:—"We were following up a huge wounded *Presbytes schistaceus* through a dense undergrowth of Ringalls when a Woodcock rose close to us, dropping again almost immediately and disappearing in the cover. A diligent search revealed the long looked-for prize, four eggs, which were deposited in a slight depression in the damp soil, and imbedded amongst a lot of wet leaves, the *thin* ends pointing *inwards* and *downwards* into the ground. The eggs found (I could see they were hard-set) I told Triphook I had no intention of leaving the place without bagging the bird. It was raining heavily and bitterly cold, with the thermometer down to 40°; but fortunately for us, before we had time to make ourselves comfortable under an adjoining tree, the bird flew back in a sort of semicircle, alighted, and ran on to her nest No sooner down than she was off again, frightened, as I subsequently learnt, at one of our dogs, but which, at first thought, alarmed me not a little, as I thought she was removing her eggs." After alluding to the shooting of the bird by Dr. Triphook, he describes the eggs, which are stated to be "darker and redder than the usual run of Woodcock's eggs, all four resembling the second figure in Hewitson's work, and in the character of their markings not unlike richly coloured specimens of Tern's eggs."

The nest is often placed near the foot of a tree, and sometimes among brackens, the dried fronds of which are used to line the depression in the soil which the bird scrapes; it is not usually concealed with any care unless it is placed in woods containing heather, when it is said to be difficult to find. Nidification in England and Europe is commenced in April and continued through May. The eggs are almost always four in number, and differ from those of its family in their round shape. In a small series from England and Sweden, for the examination of which I am indebted to Mr. Seebohm, the ground-colour varies from stony white to buff stone-colour; they are broad ovals in shape, some more pointed than others at the small end. The markings consist of rather large and small blotches of reddish brown, openly scattered over the surface, but chiefly collected round the large end, and under which lie blots of pale bluish grey. In one egg the markings are smaller and thicker. Two Swedish eggs measure 1·68 by 1·32 inch and 1·68 by 1·3; and one from Sherwood Forest 1·75 by 1·34 inch.

It is well known that the Woodcock carries its young from the nest to the feeding-grounds, and it has been thought by some that in order to accomplish this it grasps them in its feet. It is easy, however,

to perceive that the toes of a Wader are not adapted for holding any thing as bulky as a young bird. Mr. Hancock publishes some interesting notes on the subject in his 'Catalogue,' and demonstrates, for the first time I believe, the real mode in which the nestling is carried. He writes:—"In 1849 I accompanied Mr. St. John to Sutherlandshire, on an ornithological tour, and had the good fortune to observe the Woodcock perform this feat. As we were rambling in the neighbourhood of Dunrobin, where it nests regularly, we raised the bird, and at once saw the young suspended beneath the body of the parent. It was close to us when it rose, so that we had an excellent view of both the young and the old bird. 'Now,' said Mr. St. John, 'are you not convinced?' 'Yes,' I replied, 'that the young is carried, but not in the claws, which I have said, and still believe, are too feeble for the purpose.' I picked up one of the brood; it was about the size of a Snipe; when I grasped it, it made a peculiar squeaking noise. In the course of half an hour we returned to the spot and again witnessed the old bird carry off another of its chicks, and now became quite satisfied of the *modus operandi*; the young bird was pressed close up to the breast of the parent, as indeed was obvious in the first instance. Hence the inference of us both that the young was held between the legs and not in the claws." It is possible that when surprised the parent bird may seize its young with the toes; but that it does not succeed in carrying it far by this means, has been proved by an extract from the 'Lays of the Deer Forest,' published, with other information on this subject, by Mr. Harting. In this we are told that a Woodcock rose with a young bird in her feet dangling and swinging like a parachute, but that she alighted at no great distance, and getting up again dropped the bird; we are then informed that she rose again "with him in her claws;" but the inference to be drawn from her previous failures is that, in the last instance, the observations of the author were not accurate, and that at the third trial the young bird was carried between the legs.

Genus GALLINAGO.

Bill as in *Scolopax*, but with numerous pittules near the tip. Wings with the secondaries usually shorter. Tail short and variable, of from 12 to 28 feathers; the lateral ones in some very narrow and stiff. Legs proportionately longer than in *Scolopax*. Tarsus bare above the knee; the hind toe longer and with a well-developed nail.

GALLINAGO NEMORICOLA.

(THE WOOD-SNIPE.)

Scolopax nemoricola, Hodgs. J. A. S. 1837, vi. p. 490; Jerdon, Cat. B. S. India, Madr. Journ. 1840, xii. no. 336; Ill. Ind. Orn. pl. 9 (1847); Nevill, J. A. S. (Ceylon Branch), 1867–70, p. 138 (first record from Ceylon).

Nemoricola nipalensis, Hodgs. J. A. S. 1837, vi. p. 491.

Gallinago nemoricola (Hodgs.), Blyth, Cat. B. Mus. A. S. B. p. 272 (1849); Jerdon, B. of Ind. iii. p. 672 (1864); Holdsw. P. Z. S. 1872, p. 473; Legge, J. A. S. (Ceylon Branch), 1873, pp. 67, 68; Hume, Str. Feath. 1878 (B. of Tenass.), p. 459; id. ibid. 1879 (List Ind. Birds), p. 112.

Adult (Nepal: British Museum). Wing 5·6 to 5·8 inches; tail 2·8; tarsus 1·4 to 1·6; bare tibia 0·3; bill to gape 2·6, at front 2·8; middle toe 1·5.

Jerdon's data are:—"Length 12·5 to 13·0 inches; wing 5·75, expanse 18·0; tail 2·5; bill at front $2\frac{4}{5}$; tarsus 1·75. Average weight $5\frac{1}{4}$ to 7 oz."

The bill is high at the base in this species, and the tail has from 16 to 18 feathers.

"Iris dusky brown; bill reddish brown, paler at the base beneath; legs plumbeous green." (*Jerdon.*)

Head and nape shining brownish black, with only a partially developed central stripe; lores, front part of face, and chin buffy white, with a broad black stripe from the gape to the eye; a buff supercilium joining the white of the lores, and spreading behind the black ear-coverts over the sides of the nape, where the feathers are mingled with black; hind neck, interscapulars, and scapulars glossy brown-black; outer side of most of the scapular and intervening feathers with a broad rich buff margin and an oblique rufous-buff bar; wing-coverts and tertials dull brown, barred with rufous-buff; primaries, their coverts, and the secondaries plain brown; the primary-coverts tipped with whitish; back and rump blackish brown, the feathers tipped with dusky buff; upper tail-coverts rufous-buff, barred with brown; six central tail-feathers black at the base, with a rich rufous terminal band, tipped paler and crossed with dark rays near the extremities; remaining feathers brown, barred with dull rufous and pale tipped; upper part of fore neck dark brown, the feathers margined with dusky buff, increasing on the chest, and the brown portion gradually turning into bars; all the under surface dull white, rather closely barred with brown; under wing-coverts brown, barred with white; axillaries dark brown, narrowly barred with white.

Obs. This fine Snipe has no real resemblance to the last species; but on account of its large size, ample wings, dark plumage, short legs, and stout bill seems sometimes to be mistaken for the "Cock" in eastern parts by those who are not familiar with the latter bird. On picking up the bird a momentary glance at the underpart of the wing (which will no doubt catch the eye), on which *no bars will be seen*, will, together with the appearance of the legs, which are bare for a little distance above the knee, at once distinguish it from the Woodcock.

The only other large member of the genus in India is the Himalayan Solitary Snipe. It is about the same size as the present species, but longer in the wing, *pure white on the throat* and under surface, and has five stiff and narrow feathers on each side of the tail; the primaries are tipped and edged outwardly with white, and the tertials are barred with light rufous; the bill is more slender, and the bird is shorter in the leg than the Wood-Snipe. A Nepalese example before me measures:—wing 6·2 inches; tail 2·8; tarsus 1·25; middle toe 1·3; bill to gape 2·7, at front 2·8.

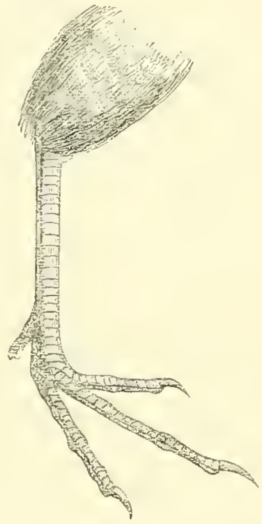
Distribution.—This fine Snipe was first recorded as having occurred in Ceylon by Mr. Hugh Nevill, of the Ceylon Civil Service, a gentleman who has devoted much attention to the ornithology of the island. He gives no particulars as to season or date of its discovery, or by whom procured, but merely says that it is found in "the country round Nuwara Eliya." It is possible that some of the accounts of the occurrence of the Woodcock in this region which are from time to time given by sportsmen may have in reality referred to this bird; on the other hand it may be only a very rare straggler in the cool season from the Nilghiris, which hills it inhabits in fair numbers. It is to be presumed that the time of its occurrence at Nuwara Eliya was during the cool season, for it cannot well be a resident in Ceylon.

Concerning its distribution in India, we do not learn much from any author, save Jerdon, who writes as follows :—"This Solitary or Wood-Snipe is found in the Himalayas, the Nilghiris, Coorg, and occasionally in the Wynaad, and other elevated regions of Southern India and Ceylon (?) ; it is also said to occur in considerable numbers in the Sharunpoor district below Hurdwar, and generally in the extensive swamps at the foot of the Himalayas . . . . It is by no means common or abundant anywhere, and on the Nilghiris but few couples are shot in general in one season." Hodgson procured it in Nepal, whence there are specimens of his in the national collection. I find no record of it from the south of India in the writings of observers in 'Stray Feathers;' but we have Mr. Hume's authority that Mr. Davison has frequently shot it in the Nilghiris.

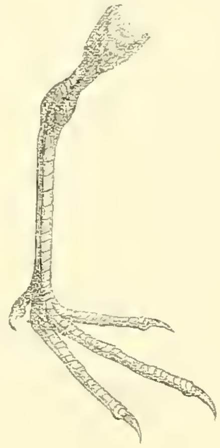
It has lately been recorded from Tenasserim; and its occurrence there has considerably extended its hitherto solely Indian habitat. Mr. Hume's note of it is :—"Davison flushed a specimen of this species in a bit of thick jungle on the banks of a little stream near Malewoon. He has shot numbers of this species on the Nilghiris, and is, he says, perfectly certain of the identification."

Habits.—The Wood-Snipe is an inhabitant, as its name implies, of jungle, being found in damp spots on the borders of forest, in swampy brushwood, near streams flowing through woods, &c. Jerdon remarks that "it flies heavily, and, having a large expanse of wing, is not unfrequently taken for a Woodcock." Mr. Nevill notes that it is found in Ceylon "among low bushes at the edge of swampy patna-lands." I am unable to furnish any detailed information concerning its habits, as I have never met with it myself; nor am I able to speak of its nidification, as no data touching it have as yet been published.

The accompanying woodcuts illustrate the difference in the legs of this species and the Woodcock, and are given for the information of local students.



Leg and foot of *Scolopax rusticula.*



Leg and foot of *Gallinago nemoricola.*

GALLINAGO STENURA*.

(THE PIN-TAILED SNIPE.)

Scolopax gallinago, Horsf. Trans. Linn. Soc. xiii. p. 191 (1821, *nec* Linn.).

Scolopax sthenura (Kuhl), Bonap. Annali di Storia naturale, Bologna, iii. fasc. 14, "Sund Islands" (1830).

Scolopax horsfieldi, G. R. Gray, Ill. Ind. Zool. pl. 54. fig. 2 (1834).

Scolopax biclavata, Hodgs. P. Z. S. 1837, p. 491.

Gallinago stenura (*nec* Temm.), Blyth, Cat. B. Mus. A. S. B. p. 272 (1849); Kelaart, Prodromus, Cat. p. 135; Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 266; Jerdon, B. of Ind. iii. p. 674 (1864); Schlegel, Mus. P.-B. *Scolopaces*, p. 12 (1864); Swinh. Ibis, 1870, p. 302; Holdsw. P. Z. S. 1872, p. 473; Hume & Marshall, Str. Feath. 1873, p. 423; Legge, J. A. S. (Ceylon Branch), p. 52 (1874); Salvadori, Uccelli di Borneo, p. 334 (1874); Hume, Str. Feath. 1874, p. 294; Parker, *t. c.* p. 335; Ball, *t. c.* p. 431; Armstrong, ibid. 1876, p. 340; Inglis, ibid. 1877, p. 46; Butler & Hume, *t. c.* pp. 212, 213; Sharpe, Ibis, 1877, p. 24; Tweeddale, P. Z. S. 1877, p. 550; Seebohm, Ibis, 1879, p. 155.

Scolopax indica, Licht. Nomencl. p. 93 (1854, *nec* Hodgs.).

Gallinago horsfieldi (Gr.), Swinhoe, P. Z. S. 1871, p. 407; Hume, Str. Feath. 1875, p. 182.

Gallinago sthenura (Kuhl), Le Messurier, Str. Feath. 1875, p. 380; Hume, ibid. (List B. of Tenass.), 1878, p. 459; Davidson & Wender, ibid. vii. p. 88; Ball, *t. c.* p. 320; Cripps, *t. c.* p. 301; Hume, ibid. 1879 (List B. Malay Pen.), p. 69; id. *t. c.* (List B. of India), p. 112.

Horsfield's Indian Snipe, Kelaart; *The Indian Snipe* of some; *Snipe*, Sportsmen in Ceylon. *Boorkat Gardung*, Malay; *Sekadidi*, Sumatra; *Burchet*, Java (Horsf.); *Narsya Snip*, Dutch in Ceylon (MacVicar); *Ulan kuruvi*, Ceylonese Tamils; also *Kora Kotu*, Coolies in Central Prov.

Kæswatuwa, Sinhalese.

Adult male and female. Length 9·5 to 10·5 inches; wing 5·2 to 5·5; tail 1·8; tarsus 1·25 to 1·3; middle toe and claw 1·5 to 1·55; bill at front 2·3 to 2·65, average 2·4 to 2·5. "Average weight 4 oz. 3 drachms" (*Parker*, Str. Feath. ii. p. 335).

Females are the larger of the two sexes.

Iris deep brown; bill, upper mandible blackish, paling to dark olive at the tip, lower basal half olive-green, darkening to brownish at the tip; legs and feet olive-green, some darker than others.

Crown, occiput, interscapulars, and scapulars velvet-black; the face, throat, supercilium, mesial head-stripe, broad lateral edges of upper back, and scapulars buff; scapulars boldly barred and striped and the head-feathers tipped with rich rufous; hind neck, back, and wing-coverts blackish brown, the former with margins, and the back and coverts with bars and tips of ochraceous grey and buff-whitish; least wing-coverts narrowly edged pale; primaries and their coverts and the secondaries dark brown, the primary-coverts and secondaries tipped with white; tertials barred with rich brown and fulvous yellow; tail with the broad feathers black, crossed by a wide subterminal band of rufous-yellow, and tipped with whitish, *the stiff lateral feathers (usually six on each side)* brown, with white tips; a

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* Although this specific name was originally spelt *sthenura*, it is incorrect, as the idea of narrowness in the lateral tail-feathers, and not strength, is meant to be implied. Στενός, meaning "narrow" (in contradistinction to σθένος, strength), indicates the correct spelling.

brown stripe from gape, passing beneath the eye to the ear-coverts; another on the cheeks; fore neck and chest fulvous, the basal portion of the feathers barred with brown; breast and lower parts white, the flanks barred with brown; thigh-coverts with the bases brown; under tail-coverts buff, obliquely barred with dark brown; axillaries and under wing-coverts white, *closely barred* with brownish black.

Summer plumage (Yenesay, 10th June, 1877). Markings of the upper surface yellower than in winter. Black portions of the feathers of the head and back more intense than in my winter specimens, and the wavy rufous-buff markings of the scapulars and tertials richer. There is a very slight green gloss on the black feathers, which tint has been said to characterize the summer dress. The throat and lores are somewhat whiter than in winter specimens; but I am not aware that this feature is constant. The measurements of this specimen, which is a male, are:—wing 5·1 inches; tail 2·1; tarsus 1·3; middle toe 1·3; bill to gape 2·38.

Specimens that I have shot in May, as they were migrating, I have noticed to have the dark parts of the scapulars, back, and tertials just perceptibly glossed with green, and the colour blacker than in winter.

Young. I have no information as to the coloration of the chick; but it is reasonable to infer that it must resemble that of the next species, which will be found described.

Obs. It is not necessary to remark on Indian examples, which are one and the same stock as Ceylonese. A singular feature in this species is the variable number of "pin" tail-feathers. Although six is the normal number on each side, yet seven and even nine have been detected on careful examination, and Swinhoe speaks of a specimen with only four. The weight given above is that of a series of Indian examples weighed by Mr. Parker, and recorded in 'Stray Feathers:' it depends greatly on the condition the bird is in. The present species is, however, a bulky bird in all respects, both as to body and bill, and weighs on the average more than the European Snipe. Measurements taken in India are as follows:—*Females*: length 10·62 to 10·87 inches; wing 5·18 to 5·25, expanse 17·5 to 17·87; bill at front 2·5 to 2·62 (*Butler*). *Females*: wing 5·08 (?), expanse 17·62 to 18·0; bill at front 2·5 to 2·54 (*Cripps*). The wing-dimension is small in both cases; in the latter, judging from the "expanse," there would seem to be an error.

An allied species to the present is Swinhoe's *G. megala*, called by this author the "Spring Snipe" of China. It differs in having the stiff lateral tail-feathers broader and coloured with rufescent white; they are also fewer in number. An example before me has five of these feathers on each side; they are barred and "indented" with black; the two outer feathers on each side are the only ones that are really narrow, being 0·1 and 0·2 inch across; the upper and under tail-coverts are rufescent; the under wing-coverts and axillaries are broadly barred with black on an impure white ground-colour. Its describer pronounced it as larger than *G. stenura*; but I question whether it much exceeds this latter. The example above alluded to measures 5·4 inches in the wing, tarsus 1·35, bill at front 2·45, which dimensions do not exceed that of an average-sized "Pin-tail."

Distribution.—The Pin-tailed Snipe visits the island of Ceylon in vast numbers, arriving in September, either early or late, according to season. I have heard it remarked that in wet years it arrives earlier than when the weather has been very dry. Such a local cause, however, could scarcely influence its migration, unless the rain had been very constant on the mainland, when, finding the country in a suitable condition to harbour it and afford it food, it would naturally continue to move southwards more speedily than if the contrary were the case. Last year (1878), which was exceptionally wet in Ceylon, saw them earlier to the fore than any other since my arrival in the island in 1868; and their occurrence in the Colombo district on the 1st September was reported by the local newspapers. In 1872 I met with Snipe in the neighbourhood of Galle on the 10th September; and this is the date when they may generally be looked for on the west coast. They do not appear to locate themselves so early in the north-eastern parts of the island, for at one of their greatest haunts in Ceylon (the Tamblegam district) there are scarcely any Snipe before the middle of October, and the shooting is, as a rule, poor up to the end of November. They are diffused over the whole of the low country, and are most abundant in large paddy-fields near jungle, and in marshy land surrounding the tanks of the northern and eastern provinces. In the western portion of the island the best Snipe-grounds are at Jayelle, near Veangodde, in the Kurunegala district, on the borders of the Bolgodde Lake, on the banks of the Bentota river, the paddy-land between Wackwella and Baddegama, and the marshy lands in the Matara district. In the interior of the south-western part of the island I have met with more Snipe in the wild secluded fields near Oodogamma than anywhere else. Indeed it is in these out-of-the-way places where Snipe congregate most, for

they are seldom visited by European sportsmen; and the only danger the birds have to fear is at the hands of the wily Singhalese gunner, who not unfrequently "pots" them in the early morning, before they have ceased to feed and seek concealment in the grass. But unless the villager is near enough to a market to be able to bring in the *Kæswatuwa* he shoots for sale, I do not think that he cares to waste his powder and shot on them. I must remark, however, in justice to native prowess, that occasionally Singhalese are to be found who can render a moderate account of Snipe on the wing.

Throughout the south-eastern districts, where there are tanks or freshwater marshes, Snipe are abundant. At Sittrawella, near Kirinde, I found them on one occasion in great numbers. There are other favourite haunts in the Yāla district; and I believe the great Moorish rice-fields, irrigated by the waters of the Ambaré and other tanks, form an excellent Snipe-ground. I have already alluded to the neighbourhood of Tamblegam bay, which is one of the best grounds in the island, and there are other excellent spots both in the interior and on the north-east coast. In the Anaradhapura and Vavonia-Velankulam districts they are generally abundant, as also in the Jaffna peninsula.

From the low country the Snipe finds its way into those portions of the hills where the locality is suitable to its habits; it affects the Dumbara paddy-lands and the terraced fields in all the Kandyan valleys; and during December and January great numbers frequent the Fort-Macdonald district, and furnish excellent sport for the planters of the surrounding neighbourhood. They are found on all the upland plains on the Nuwara-Eliya plateau, and are numerous on the Horton Plains, which form, of course, the highest Snipe-ground in the island.

About the middle of April the Snipe begin to move northward, and by the end of the month the majority have left the island. I have met with them in the Galle district as late as the 3rd of May, and have heard of their occurrence a little later than this. Some *few* birds *occasionally* remain in the island throughout the year; but these are evidently unfit for migration, owing to wounds, or, in some cases, they may be first-year birds, which, as in the case of other Waders, remain stationary the first year. There can be no other cause to make Snipe remain in such a tropical latitude as Ceylon.

On the mainland of India the Pin-tailed Snipe is most abundant in Lower Bengal, in portions of Central India, parts of the Deccan, the Carnatic, and the south of the peninsula generally. It is also numerous in Assam, Pegu, and the Rangoon district. These are the portions of Indian territory which it would naturally chiefly affect, seeing that it must of necessity enter India from its Central-Asian breeding-haunts by way of Assam and Northern Burmah; and the migratory stream would therefore flow down the eastern side of the empire and end in Ceylon.

Verifying these remarks, we find Mr. Hume noticing many specimens from Assam, Mr. Oates saying that it is the Common Snipe of Upper Pegu and very abundant at Tonghoo, and Dr. Armstrong recording it as very abundant in the Irrawaddy delta. Again, Mr. Inglis finds that it is extremely common in North-east Cachar, Captain Beavan testifies to its being more numerous than the European Snipe at Barrackpore, and Mr. Cripps to its being common in Furreedpore. It seems then to skip over a large tract of country in Chota Nagpur, which would seem to be tenanted chiefly by its European ally. Mr. Ball says he never met with it in the "division" in question, and only notes it from Manbhum, I conclude, on Captain Beavan's authority; he, however, records it from the Godaveri valley. From the Mahabaleshwar district Dr. Fairbank does not notice it; and Messrs. Davidson and Wender say that it is not so common in the Deccan as *G. scolopacina*. In the Carnatic it is more abundant than the latter; and it is *the* Snipe of the Nilghiris. Mr. Bourdillon remarks that they are found at all elevations in the Travancore hills, and that they are more numerous at Trevandrum, in the plains, than the other species.

In Northern and Western India it is rather rare. Major Le Messurier and Mr. Blanford have recorded it in 'Stray Feathers' from Sindh, but no one else; and Captain Butler says that it is not common near Mount Aboo; he procured it at Milana and near Ahmedabad; and the date of its earliest arrival in this district is given as the 24th August. Captain Hayes Lloyd does not record it from Kattiawar.

Turning eastward again, to trace out its winter quarters in that direction, we find that it is common in suitable localities throughout Tenasserim, and was procured by Mr. Davison on the Pakchan, in the extreme south. In the Malay Peninsula it is recorded from Wellesley Province and Malacca; and at Singapore it was procured

by Peale. In the Andamans it is the commonest Snipe of the two species, and is very abundant at Aberdeen, South Andaman, and Mount Augusta. It was also observed by Mr. Hume in the Nicobars.

Swinhoe notes it as found throughout China, Hainan, and Formosa in winter. In Hainan he observed it until the end of April, and at Cheefoo he obtained it in May. About Pekin it is found, according to Père David, at the beginning and end of the summer. It was procured for the first time in the Philippines at Zamboanga by the 'Challenger' naturalists, and recorded by Lord Tweeddale in the P. Z. S. 1877. In Sumatra it was obtained by Raffles and S. Müller, and in Borneo by Schwaner, Doria and Beccari in Banjermassing and Sarawak; and Mr. Everett recently obtained an example in February in the district of Sibu. Mr. Wallace records it from Timor, which is the limit of its range to the south-east.

As regards the region to which it returns for breeding, this would seem to be Mongolia, the Lake-Baikal district, and Central and Eastern Siberia. It is not recorded from Turkestan, which shows that it does not migrate round the western end of the Snowy Range; but Col. Prjevalsky says it breeds in tolerable numbers on the Ussuri, and is more plentiful still during migration. In South-east Mongolia he found it rare, and did not observe it in the Hoang-ho valley or in Kan-su and Koko-nor.

Middendorff does not seem to have met with it in Siberia, and Schrenck does not record it from the Amoor; but in this region it has probably been overlooked, as Swinhoe has seen examples from Lake Baikal. Mr. Seebohm, to whose kindness I am indebted for an examination of the above-mentioned example, procured this species in 1877 on the Yenesay, within the Arctic circle; and this is the most northerly point from which it has ever been recorded. He thus writes of it in his interesting paper on the birds of Siberia:—"The first Wader which arrived at our winter quarters on the Arctic circle was the Pin-tailed Snipe. We shot a couple on the 5th of June, three days after the ice began to break up on the great river. Three days later they were exceedingly common on the oases of bare grass which the sun had been able to make in a few favourable situations in the midst of the otherwise universal desert of melting snow."

Habits.—This Snipe, which may be called the eastern representative of the common species, resembles it very much in habits, differing from it simply in a few minor points. Like the latter it is a sociable and gregarious bird, frequenting (in Ceylon) paddy-fields, and by choice those which are grassy, weedy, and partially cultivated, the margins of tanks, rushy swamps, marshes interspersed with small jungle, and also the borders of rivers, where, unlike its European congener, it may sometimes be seen, more especially at the end of the season, running along the mud like a Sandpiper. Large tracts of ground which look admirably suited for it may be walked over and not a bird seen; other fields will then be entered upon where, to judge by a cursory glance, no Snipe would be likely to be met with, but in which all the birds in the neighbourhood will be found collected; and they rise one by one in scattered company, or in "wisps" or flocks of half a dozen to a score or more. A particular sort of vegetation, probably weeds overrunning the grass, and affording them excellent shelter, or an abundance of food in the immediate vicinity of their retreat, or even on the spot itself, will have been the cause of their reunion in the early morning from the feeding-grounds they have frequented during the night. Though not associating in close company, they are nevertheless sociable birds, for any favourable condition of food or concealment will bring them together; and they do not appear to object to the tolerably near proximity of their kind. In one small field of a few acres, which had been recently flooded, leaving the soil soft and muddy, and which was covered with a species of running-weed or vetch, forming a tangled mass or cloak of vegetation at about 6 inches above the ground, I once found many scores of Snipe. It was a piece of Snipe-ground *par excellence*; they could move about on the muddy ground, and bore to their heart's content beneath the canopy of weed without being seen. It has been said by some that the Pin-tailed Snipe does not frequent the same ground as the Common; but this depends entirely on the food searched for, and the locality in which it is found. When feeding it may be met with in all kinds of marshy damp situations, where the soil is favourable for "boring;" but when not feeding it is true it will settle down in places unlike those chosen by the Common Snipe. In the low country it retreats into the jungle during the heat of the day, and may be flushed from beneath bushes, the sides of paths, or even from little sandy plots surrounded by trees. On the upland patnas of Ceylon it is often found resting on dry rising ground, as if the low-lying feeding-grounds were too damp and cold for it. I have also put them up in dry grass-fields resting on dead leaves; but these instances are those of birds which have been disturbed; and when once a Snipe is driven out of its retreat it will settle down anywhere.

This species feeds almost entirely on aquatic insects of various size; for I have found small Coleoptera in the stomachs of some I have examined; and in India caterpillars have been found occasionally; and when at the close of the season they frequent mud banks, where I have seen them on the Gindurah river, they no doubt feed on mollusks and crustacea. Mr. Davison writes to Mr. Hume of a Pin-tailed Snipe seen in the Andamans:—"On the 27th of December I saw one of these birds feeding on the shore about 2 P.M. It was running hither and thither, like an *Actitis*" (Sandpiper). It would have been interesting to have examined the stomach of this bird and recorded its contents.

The note of this species is a *sc-ape* or *ps-ape*, like that of the Common Snipe, but not quite so harsh in sound. Its flight, when it happens to be "wild," is just as swift, though perhaps a little steadier. When found in quiet unfrequented spots, where it is sometimes very tame, it lies close and flies sluggishly for a short distance; and I have even seen it rise trailing its legs like a Rail. I have noticed this occur on very hot afternoons, when the bird has in all probability been feeding undisturbed during the morning, and has become thoroughly satiated and lazy. When running they project the neck forward and droop the bill slightly; and the movement of their legs is not swift, as those of a Sandpiper.

The Pin-tailed Snipe affords excellent shooting; and there is, in fact, no other bird-sport to be had in the island, as the Bush-Quail are not abundant enough, and the Red-legged Partridges, as we have seen, are confined to certain localities. The largest bags are made in the Trincomalie and Kurunegala districts, in the former of which, during my residence in the island, 71½ couple were on one occasion killed by an officer, Lieut. Preston, of the 73rd Regiment. I am under the impression that as great a number have been killed to one gun in the neighbourhood of Kurunegala; but I am not in possession of data to enable me to speak positively.

Nidification.—The only information we have concerning the breeding of this species is from the pens of Col. Prjevalsky and Mr. Seebohm. With reference to the Ussuri river, where it nests in the month of April, the former writes ('Birds of Mongolia'):—"In the latter half of April the birds choose their nesting-localities in the thinly overgrown marshes, and their peculiar courting commences. Rising into the air, similar to our *G. scolopacina*, and describing large circles above the spot where the female is sitting, it suddenly dashes downwards with great noise (which is most likely produced by the tail-feathers, like that made by our species, and somewhat resembles the noise of a broken rocket). As the bird approaches the ground the noise increases, until it has got within a hundred yards, when it suddenly stops the sound, and quietly flies on, uttering a note something like '*tiric, tiric, tiric.*' Courtship lasts until the middle of June, and is mostly heard or seen in the mornings and evenings, but occasionally in the daytime, and even at night in clear weather." Mr. Seebohm met with it on the Arctic circle, and observes (Ibis, 1879, p. 155) as follows:—"They used to come wheeling round, uttering a loud and rather shrill cry (some idea of which may be gathered by the sound of the word *peezh*, long drawn out); then they used to drop down with a great whirr of wings, and with tail outspread—an operation which seemed so engrossing that they appeared seldom to discover until they were on the ground that they had chosen a spot to alight within twenty yards of a man with a gun. It was amusing to see them find out their mistake. Sometimes as soon as they caught my eye they would take wing and fly quietly away; but more often they would hurry off as fast as their legs could carry them, and hide behind a tuft of grass or a bush. I never heard the Pin-tailed Snipe 'drum,' as the Common Snipe often does, when wheeling round and round at a considerable height in the air; nor did I ever hear the *tyik-tyuk* so characteristic of the Common Snipe."

It is noteworthy that while one writer speaks so clearly of the drumming noise, the other did not hear it. Col. Prjevalsky, though he writes of the species under the name of *Gallinago heterocerca*, Cabanis, can refer to no other than the present bird, more particularly as the next species he notices is *G. megala*, which, together with the Pin-tailed Snipe, are the only species found in this region. Mr. Harting considers that *G. heterocerca*, Cab., = *G. megala*.

The discovery of the nest and eggs remains yet to reward the labours of some adventurous ornithologist in these northern regions.

GALLINAGO SCOLOPACINA*.

(THE COMMON SNIPE.)

Scolopax gallinago, Linn. Syst. Nat. i. p. 244 (1766); Gmelin, ed. Syst. Nat. i. p. 662 (1788); Gould, B. of Eur. iv. pl. 321 (1837); Middendorff, Sibir. Reise, ii. p. 224 (1853); Shrenck, Reisen und Forsch. Amur-L. p. 426 (1860); Seebohm & Harvie Brown, Ibis, 1876, p. 309; Anderson, Yunan Exp. p. 681 (1878).

? *Scolopax gallinaria*, Gmelin, ed. Syst. Nat. i. p. 662 (1788).

Gallinago media, apud Leach, Cat. M. & B. Brit. Mus. p. 31; Sykes, Cat. B. Dukhun, P. Z. S. 1832, p. 163; Godman, Ibis, 1866, p. 101; Shelley, B. of Egypt, p. 249 (1872).

Gallinago scolopacinus, Bonap. Comp. List B. Eur. & N. Amer. p. 52 (1838); id. Compt. Rend. xliii. p. 579 (1856); Blyth, Cat. B. Mus. A. S. B. p. 272 (1849); Kelaart, Prodromus, p. 110, et Cat. p. 135 (1852); Layard, Ann. & Mag. Nat. Hist 1854, xiv. p. 266; Jerdon, B. of Ind. iii. p. 674 (1864); Schlegel, Mus. P.-B. *Scolopaces*, p. 4 (1864); Swinhoe, P. Z. S. 1871, p. 407; Holdsw. P. Z. S. 1872, p. 473; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1201 (1873); Legge, J. A. S. (Ceylon Branch), p. 70 (1873); Hume, Str. Feath. 1873, p. 235; Hancock, B. of Northumb. p. 105 (1874); Hume, Str. Feath. 1874, p. 295; Irby, B. of Gibraltar, p. 175 (1875); Hume, Nests and Eggs, iii. p. 580 (1875); id. Str. Feath. 1875, p. 182; Walden, Trans. Zool. Soc. ix. p. 235 (1875); Butler & Hume, Str. Feath. 1876, p. 15; Scully, *t. c.* p. 186; Fairbank, *t. c.* p. 263; Blanford, Zool. Persia, p. 282 (1876); Hume & Davison, Str. Feath. 1878 (B. of Tenass.), p. 459; Davidson & Wender, ibid. vii. p. 88; Ball, *t. c.* p. 228; Seebohm, Ibis, 1879, p. 156.

Gallinago gallinaria (Gm.), Cripps, Str. Feath. 1878, p. 302; Hume, ibid. 1879, p. 70 (List B. of Malay. Penin.); id. *t. c.* p. 112 (List B. of Ind.).

Bécassine, Buffon; *Gijach*, Welsh; *Agachadizà*, Spanish (Saunders); *Agachona*, Andalucia (Irby); *Maçanico real*, Azores (Godman). *Choseh*, *Chuschah*, Arabic (Von Heuglin); *Ji-shigi*, Japanese (Blakiston); *Äzzi*, Amuria (Schrenck); *Bou monkar*, lit. "Father of the bill," Moorish (Irby); *Bharka Bharak*, Hind., also *Chaha*; *Soorkhab*, lit. "Sucker of Water," of some Shikarees; *Muku puredi*, Telugu; *Chegga* Bengal.; *More-ulan*, Tamil; *Mah ramcki*, lit. "The Solitary One," Turki (Scully).

Kæswatuwa, Sinhalese.

Adult (Ceylon, Jan. 1873). Length 11·0 inches; wing 5·2; tarsus 1·17; tail 2·5; middle toe and claw 1·35; bill at front 2·66.

Iris dark brown; bill reddish brown, pale at the base beneath; legs and feet greyish green.

* The Linnean and oldest title of the Snipe cannot unfortunately be applied to it, as the specific name is the same as the now-employed generic one, the Snipes having very properly been removed from the genus *Scolopax*. As, therefore, the Stricklandian code forbids the use of the name *Gallinago gallinago*, the next oldest name is that of Bonaparte's, as Leach's prior title had been applied by Latham to the Great Snipe before its bestowal on the present species. With regard to Gmelin's name, *gallinaria*, previously applied by O. F. Müller (Zool. Dan. Prodr. p. 23, 1776), it can only be remarked that it cannot possibly apply to the Common Snipe, as the description runs, "*pedibus flavis, capite toto grisea*, &c."

Adult female (Wales). Length 10·3 inches; wing 5·3; tail 2·4; tarsus 1·3; middle toe without claw 1·2; bill to gape 2·55; expanse 17·0. Weight $3\frac{3}{8}$ oz.

This Snipe has 14 tail-feathers, and the lateral ones are not rigid, and but little narrower than the adjacent.

Obs. This species so closely resembles the last (to which I have given precedence as being the ordinary Snipe of the island), that it is only necessary to point out its distinguishing characteristics as follows:—

Winter plumage. Differs from the Pin-tailed Snipe in having a slenderer and, *on the whole*, a longer bill and shorter legs and feet; in wanting the narrow, rigid "pin"-feathers on each side of the tail; in having the axillaries barred with paler, narrower, and much more *distant* bars; in having the under wing-coverts along the edge of the wing much less barred, and the greater secondary series more or less uniform white, the brown bars being chiefly confined to the base; and in the *conspicuous white tips* to the secondaries. The lateral tail-feathers are white, with a black bar near the tip, and a broader band, chiefly on the inner web, near the base. The buff margins of the scapular feathers are perhaps, as a rule, broader; but this character is uncertain, and chiefly applies in summer plumage.

Summer plumage. This is characterized merely by a brighter and more glossy plumage. An example from the Yenesay (Arctic circle), collected by Mr. Seebohm, now before me, measures as follows:—wing 5·1 inches, tail 2·3, tarsus 1·25, bill at front 2·6: has the occipital and loral stripes and the chin whiter than in winter specimens, and the black feathers of the back and scapulars glossed with green and more richly variegated with rufous-buff than in winter specimens; the broad lateral margins of the scapulars are almost white, instead of buff, which has the effect of setting off the black portions more clearly.

Young (nestling, in down: Brit. Mus.). Above deep ferruginous, mingled with black, and mottled on the head and back with white; a band of black and rufous passes from one eye to the other across the forehead, at the base of the bill, above which is a rufous-buff band surmounted by a black patch; the cheeks are white, below which, and on the ear-coverts, there is a black patch; chin and throat buff, crossed by two black bands, beneath the lower of which the fore neck is rufescent; lower parts paler; rump brownish, mottled with white. Bill to gape 0·58 inch.

The nestling Snipe differs from the Woodcock in its darker ground-colour and white mottling, besides which the *bare tibia* would serve to identify it at once.

In an example about ten days old the black markings predominate over the rufous, the head is boldly marked with the white down, and the feathers have appeared on the hind neck and scapular regions, and are black, barred with rufous and edged with buff; the wing-coverts are likewise black, tipped with white. Bill 1·2 inch at gape.

These remarks are based on a specimen in the national collection.

Immature birds in the first autumn closely resemble adults; but the buff markings are not so rich, the chest is not tinged so much with this colour, the tips of the wing-coverts are whiter, and the axillaries are more barred, nearly approaching those of the "Pin-tail" in character; but the *white interspaces* are *broader than the dark bars*, and the reverse is the case in the last-named species. The inner web of the lateral tail-feather is darker than in the adult. There is little if any difference in the length of the bill.

Obs. Although the "pin"-feathers in the tail of the last species constitute its chief distinguishing characteristic, yet, even to the eye of a moderately close observer, the above-indicated differences (concerning which there has been some controversy in 'Stray Feathers') must surely be at once apparent. The present species *never* has the axillaries and under wing barred like the Pin-tail; and, further, its long and proportionately slender bill cannot fail to distinguish the Common Snipe from its Indian ally. It has been said to average lighter in weight; and, as I have stated in the preceding article, it appears to do so. The weight of a Snipe, however, depends so much on its condition that it is unsafe to rely upon it as a distinguishing feature. Mr. Parker (Str. Feath. 1874, p. 335) gives the average weight as 3 oz. 3 drms. Mr. Cripps notes the weight of eleven males from Furreedpore as 3·75 to 5·12 oz., the last-named being excessive; of the three females he records it as 3·5 to 5·0 oz. A large British series weighed by me, and for me by friends, range between $2\frac{1}{2}$ and $4\frac{1}{2}$ oz., the average being a little short of 4 oz.

The so-called *Sabine's* Snipe, *G. sabinii*, is an interesting variety of the present, sometimes procured in England. It was originally considered to be a distinct species. Its general appearance is brown; beneath brownish rufous, with bands of brown taking a concentric form on the lower parts; head dark uniform brown, without the mesial stripe; the buff margins on the scapulars wanting. An example from Queen's County, Ireland, in the national collection, measures—wing 5·2 inches, tarsus 1·25, bill at front 2·55.

Gallinago major is intermediate between the Pin-tail and the Common Snipe. It has sixteen tail-feathers, the four outermost on each side being white and rather stiff, though but little narrower than the rest. Its bill is stout and high at the base, like that of the Pin-tail. It may be recognized at once by the broad white tips of the primary-coverts and outer series of lesser, median, and greater wing-coverts; the *edge* of the outer web of the 1st quill is white; the cheeks are more spotted than in the foregoing two species, and the sides of the breast more barred; the barring of the under wing and the axillary plume is intermediate, the dark bands being broad, but not so close as in *stenura*; the coloration of the centre tail-feathers is almost that of the last-named species. Dimensions of a Yenesay-valley example before me are—wing 5·7 inches, tail 2·4, tarsus 1·45, middle toe 1·35, bill at front 1·4. A Petchora-river specimen likewise measures 5·7 inches in the wing.

Gallinago wilsoni, Temm., the American representative of the Common Snipe, appears to me almost undistinguishable from it. The lateral tail-feathers are slightly narrower and without so much rufous; the 1st quill is white on the outer web, as in the present, and the axillaries are the same. An example measures—wing 5·4 inches, bill at front 2·55.

Gallinago australis, Latham, is the Australian representative of the present, but chiefly resembles *G. major*. Number of tail-feathers sixteen, the four outer ones marked irregularly with white; under wing-coverts and axillary plume barred with blackish brown, like the Pin-tailed Snipe. A December example in my collection has the black of the scapulars and upper back very strongly glossed with green, the feathers with broad margins of black and rufous, and some central stripes of buff marked with black. The broad stripe over the vertex is buff. Bill greenish black near the tip, and brownish along the culmen and margins, the intermediate stripe and the base being greenish yellow; legs and feet greenish yellow. Length 12·7 inches, wing 6·7, tarsus 1·6, bill at front 3·0.

Found as far north as China and Japan.

Gallinago macrodactyla, Bonap., is the South-African representative of the Common Snipe. It has sixteen rectrices. The bill averages longer than in *G. scolopacina*; toes likewise longer. A specimen before me measures—wing 5·2 inches, tarsus 1·43, middle toe without claw 1·43, bill to gape 3·0. Axillaries openly barred; the bands black-brown; dark portions of head, back, and scapulars intensely black; three lateral tail-feathers narrow and stiff, almost entirely white, the dark markings being scanty.

Ranges as far north as Abyssinia.

There are other Snipes, five of which (*G. gigantea*, Natt., *G. paludosa*, Gm., *G. nobilis*, Scl., *G. frenata*, Bonap., and *G. paraguaiæ*, Bonap.) are found in South America.

Distribution.—The Common Snipe was said by Dr. Kelaart to have been seen by him at Nuwara Eliya, and his statement is coupled with the remark that it is found in some of the highland districts. Layard did not meet with it, nor did Mr. Holdsworth detect it while he was in the island, although he spent much time at the Sanatarium. Kelaart's evidence cannot therefore be considered satisfactory, more particularly as he was not an accurate observer of birds. In 1873 I was enabled to publish, in the 'Proceedings' of the local branch of the Asiatic Society, an account of its first authenticated occurrence on the island. Two specimens were shot by Major Meaden, of the Ceylon Rifles, at Tamblegam, in January of that year, while I was stationed at Trincomalie; and one of these, which was obtained on the 6th of that month, is the example alluded to above. Both this gentleman and other sportsmen in the garrison informed me that they had met with it more than once at the same locality; so that I have no doubt it not unfrequently visits the north of the island in small numbers, and, finding such good quarters in that part, it is not likely to wander either into the hills or the southern half of Ceylon.

It is distributed over Europe, the northern portion of Africa, more or less over the whole of Asia (retiring chiefly to the north in the breeding-season), and extends to Formosa and the Philippines.

As regards India, we find that it arrives in the north-west in August, the 24th being Capt. Butler's earliest date of its observed occurrence in Guzerat. It is, according to him, common in the plains, and likewise occurs about Mt. Aboo. In Sindh it is abundant, Mr. Hume having met with it in all suitable localities; and he records it as plentiful in Cutch, Kattiawar, and other portions of this north-western region. In the Sambhur-Lake district it is, says Mr. Adam, rarely met with; but this is owing to the country being unsuited to it. In Bengal it is very abundant, and in the neighbourhood of Calcutta it is exceedingly numerous. In Chota Nagpur Mr. Ball notes that it occurs throughout the division, but not in abundance. In the district between the Ganges and the Godaveri he records it from Bardwan, Manbhum, Sirguja, Gangpur, Sambalpur, Orissa, Nowagarh, Karial, and Jaipur. In Furreedpore it appears in October, and leaves about the end of March (*Cripps*). In the Bombay district it is not uncommon; and in Khandala the Rev. Dr. Fairbank writes that it

is found in small numbers in all marshy places; Messrs. Davidson and Wender, speaking of the Deccan generally, say that it is commoner than the last species. In the Carnatic it is generally less plentiful than this latter, although in some seasons it has been said to occur about Madras in equal numbers with the "Pin-tail." In the Palanis it is only found in small numbers; and Mr. Bourdillon says it is less abundant at Trevandrum than its ally. In Upper Burmah, according to Jerdon, they arrive in small numbers as early as July; but these, I infer, are birds that have not been far north to breed. In Pegu, however, Mr. Oates affirms that the Common Snipe does not appear till December, and is then not so plentiful as *G. stenura*. In the Irrawaddy Delta Dr. Armstrong did not meet with it; and in Tenasserim it is a rare visitant to the "central portions of the province and the tract west of the Sittang river." Further south, in the Malay Peninsula, it is a rare straggler, having been recorded solely from Malacca. It is likewise the same to the Andamans, Mr. Davison having met with only one example.

It is a winter visitor to China, Hainan, and Formosa according to Swinhoe. In Formosa he met with it as early as the 22nd October; in Hainan he obtained it in February. It has been obtained in the Philippines in the island of Luzon, where Dr. Meyer met with it in the month of February.

In summer it wanders north to breed, and has been obtained on the Arctic circle by Mr. Seebohm. At Obdorsk also Dr. Finsch met with it, observing it likewise near lakes in the vicinity of Kara Bay. Schrenck met with it on the Lower Amoor in June; and it has been obtained on the Schilka in May. Middendorff procured it far up in the north-east of Siberia, finding it breeding on the Boganida, near Taimyr-land; and he obtained an example as early as the 29th of April in a mountain-brook on the western slopes of the Stanowoi Mountains. There is no reason, therefore, to doubt that it does not reach the very confines of North-eastern Siberia in its migration, and it will probably be found some day on the Anadir river. It is common throughout Japan, according to Mr. Blakiston; and Mr. Whitely likewise records it from Hakodadi. Many Snipe, however, breed in the highlands of Central Asia. We have Severtzoff's authority for it nesting throughout Turkestan; and Dr. Scully found it breeding at Yarkand, taking its eggs in June. In Persia, writes Mr. Blanford, it is common in suitable localities, and was obtained by him at 3000 feet above the sea. In Palestine it was only observed by Canon Tristram in winter, leaving the country before June. In Southern Europe and the Mediterranean islands it is common in winter; but it moves north in summer, and does not, as a rule, breed south of Central Germany, although the mountains of Transylvania are, according to Bieltz, an exception to this. Col. Irby writes that it leaves Spain entirely by the first week in April, returning again as early as the beginning of September. Mr. A. G. More, in his 'Distribution of Birds in Great Britain during the Nesting-season,' says that it breeds regularly in almost every county in England; but it is of course far more numerous in the summer in the north and in Scotland than in any of the southern counties. In Wales it likewise nests in many localities; and in Cardiganshire a considerable proportion of Snipe are resident and county-born.

Turning lastly to Africa, we find Favier, as recorded by Col. Irby, stating that this Snipe is common round Tangier from October till February. In Algeria Mr. Gurney found it common; and in Egypt and Nubia Captain Shelley states that it is generally distributed and abundant where there is suitable ground. In large marshes in Lower Egypt he has killed more than forty couple in a day. At the end of March they decrease; but some isolated examples are to be met with, says Von Heuglin, in Lower Egypt during the summer months. This author states that they are most numerous in Lower and Central Egypt in spring, and that in the winter they retire southwards to the Blue and the White Nile and to Abyssinia; in October he met with Snipe at the Dobar springs, in the Somauli territory. In Western Africa it has been obtained in Gambia; and Bolle records it as a winter visitant to the highlands of the Canary Islands. In the Azores Mr. Godman met with it in Flores, where it frequents moist places in the mountains. According to Professor Baird it is common in South Greenland; and he records likewise the capture of one example in Bermuda.

Habits.—In its economy the Common European Snipe resembles the last bird, but is, perhaps, a more persistent adherent to marshes, the edges of streams, bogs, morasses, and permanently moist places. Finsch, however, found it living in the Kara-Bay district, North-western Siberia, on dwarf-birch-covered land, which shows that it is uncertain in its likes and dislikes in the breeding-season. It is chiefly a nocturnal feeder, and is found when looked for in the spots on which it has settled down in the early morning. On being

flushed, it generally flies off uttering the well-known *sca-ā-pe* or piping cry peculiar to its genus, and almost invariably proceeds against the wind. When wild, it mounts in the air, and, if it has been walked up "down-wind," after getting out of shot turns round against wind and flies off with a tumbling flight, proceeding from side to side in its course; and well up in the air, seen against a cold grey English sky, it looks twice the size it does when rising out of the grass.

When observed in northern regions during the time of its nidification its habits are very interesting, and the life of concealment which it leads with us during the winter is changed for one of animation and excitement. Its habit of "drumming" or making a humming noise while flying over its nest has been the subject of much discussion and difference of opinion; and I will refer to the matter in the "Nidification" of the species. Messrs. Seebohm and Harvie Brown have published some interesting notes on the species as observed by them on the Petchora river, Northern Russia, which I here transcribe:—"We were not a little surprised when we first became acquainted with the arboreal habits of the Snipe at Habariki, and saw one of these birds perched, 70 feet from the ground, on the topmost upright twig of a bare larch, where, one would have thought, it could scarcely find sufficient foothold. With its head lower than its body and tail, it sat there, uttering at intervals the curious double 'clucking' note, *tjick-tjuck, tjick-tjuck,* whilst others of the same species were 'drumming' high in the air over the marsh. To put all beyond doubt, Harvie Brown shot one in this peculiar position. Nor is the Common Snipe the only bird which, not practising the habit with us, we found perching freely in Northern Russia: the Snow-Bunting and Pipits have already been instanced; and we may also mention the Common Gull, as will be seen under the notice of that species further on . . . . . There can be little doubt, we imagine, that this habit was induced, in the first instance, by the flooding of great tracts of country by the annual overflow of the rivers in spring, just at the time of the passage of the migratory flights, and, further, that what was originally forced upon them has become, by use, a favourite habit."

In India the great resorts of the Common Snipe are the paddy- or rice-fields in the cultivated districts of the empire; and here very large bags are made by good shots. Jerdon speaks of 100 couples being killed to one gun in the south of India even; but among these no doubt was a large proportion of the last species. Although the popular idea obtains that Snipe only feed on "suction," *i. e.* on the liquid, impregnated with minute larvæ, which is obtained by boring in the mud with their long bills, a much greater quantity of animal matter is consumed by them than these advocates of the suction-theory imagine. Good-sized aquatic insects, particularly of the beetle order, and occasionally tolerably large worms, may be found in their stomachs; and it is pretty certain that a Snipe will never refuse to swallow any worms that it meets with.

Col. Irby, in his 'Birds of Gibraltar,' mentions that the best ground for Snipe in Morocco and Andalucia is "where sedges and rushes had been burnt during the summer;" but, there being no cover in such places, it was "useless to try and walk up to the birds, and the only way was to stand or sit perfectly still in the most favourite spot and await their return."

In Egypt their favourite haunts, according to Captain Shelley, are the large marshes in the delta of the Nile, in which he has killed more than forty couple in a day. Von Heuglin remarks that in February and March a good shot can, under favourable circumstances, kill from sixty to eighty head a day in the same district.

Very large bags were formerly made on the Irish bogs, rivalling, in fact, those of Indian sportsmen; but now-a-days, since drainage has made such alterations, Snipe-shooting is not what it used to be, and twenty couple would be considered a very good bag. I am informed that a gentleman last year killed thirty-seven couple on Sir Arthur Guiness's estate in Galway; and an account has been given to me, on good authority, of the late Mr. John Dennis, master of a celebrated pack of Galway hounds, having made a wager that he would shoot fifty couple, which feat he more than accomplished by killing forty before 11 o'clock, and finishing with a total of eighty-four couple before night. This was more than forty years ago.

Nidification.—This Snipe's eggs have not, to my knowledge, been taken in India; but there is reason to believe that it may possibly breed occasionally in Cashmir, as it does so on the other side of the range in Kashgar. Mr. W. Brooks, writing to Mr. Hume, has the following remark on its summer occurrence in Cashmir:—"I saw a Common Snipe soaring away above when I took the Mallard's nest (near one of the Cashmir lakes); and as it was making its breeding, bleating, and drumming noise, doubtless its mate was sitting on its nest below, though I failed to find it." Dr. Scully found it breeding at Yarkand in May and

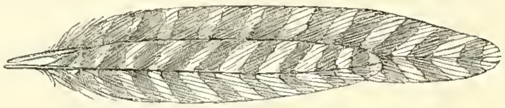
June, and obtained eggs on the 12th of the latter month. In the territory of Jakoutsk, North-eastern Siberia, and in Taimyr-land, the breeding-season commences at the beginning of June, and the young are about at the end of July. Von Middendorff writes:—"On the 11th of June a female which we killed contained an egg with an already hard shell; on the 21st of June a nest with four eggs was found. On the 31st of July the young were almost fully feathered, and on the 5th of August the last example of the species seen there was shot."

The nest is placed on the ground, usually in a little depression near a tuft of grass or little earth-mound; and this is lined with dried grass, a few leaves, or sprigs of heather. The eggs vary from three to four in number, and are very variable in colour. A beautiful series of specimens in Mr. Seebohm's collection are respectively greyish stone of various tints, olive-stone, and brownish buff in ground-colour, and vary as much in markings: some have zones of confluent colouring (sienna-red) round the large end, on which another zone of linear markings of black is scribbled; others have the large end surrounded by clouds and blotches of rich sepia of two shades, with here and there a few streaky marks, while the rest of the egg is richly marked with softened blotches of sepia. Others are rather thickly blotted all over with sepia over bluish-grey spottings, with inky-black blotches at the top; these are the palest eggs. Some, again, are clouded over the large end with sepia, and very sparingly marked at the small end with the same, with the usual hieroglyphic scribblings at the first-named part. These eggs vary in length from 1·46 to 1·64 inch, and in breadth from 1·06 to 1·13 inch. Dr. Scully describes the eggs he obtained in Kashgar as being of a dirty olive-green colour, the large end nearly covered with confused blotches of brown and brownish black, and the constricted portion marked with some largish spots of brownish. Dimensions of two specimens 1·58 by 1·11 inch and 1·58 by 1·13 inch.

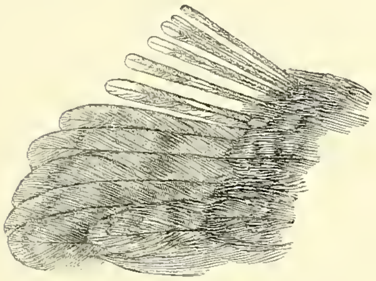
I have referred above to the singular noise made by the Snipe during the breeding-season, which is variously termed "bleating," "neighing," "drumming," and which is made by the bird when, after flying round and round its nest or young, it descends with wings and tail extended, with an apparently tremulous motion of both, its whole frame being at the time in a state of rigidity or extreme tension. Some years ago Herr Meves, of Stockholm, published a paper detailing an account of some ingenious experiments which he had carried out with a view of proving that the sound was made by the bird's tail-feathers. His theory seems to have obtained general credence on the supposition, apparently, that because a man under certain conditions could succeed in making various sounds with the outer tail-feather of a Snipe, the bird itself must necessarily do the same! Herr Meves's experiment consisted in tying the outer tail-feather, which has a sickle-shaped and *rather* rigid shaft, a narrow outer and a broad inner web, to a wire $\frac{1}{10}$ inch in diameter, lashing the latter to a stick about 5 feet long (whereby he obtained a "play" or "stroke" of about 5 feet), and then moving it backwards and forwards in a horizontal position, accompanied by a tremulous movement of the arm. He thus succeeded in making a noise which he considered was astonishingly similar to that produced by the Snipe. Mr. Hancock, in his valuable catalogue of the birds of Northumberland and Durham (*loc. cit.*), was apparently the first to point out that the vibrations of the outer tail-feather as made by the Snipe cannot possibly be similar to those made by Herr Meves, and states that he made the same experiments without succeeding in producing the sound in question; and at the same time aptly remarks that a much nearer approach to it can be made "by waving backwards and forwards, with short strokes, a cane 2 or 3 feet long." The whole matter hinges upon the conditions under which the feather is moved, as also the *distance from the ear*. It is swayed backwards and forwards, in the manner he described, at a distance, or with a radius, of some 6 or 7 feet from the centre of motion; and of course a whizzing sound can be made, as the feather is stiff and very peculiarly constructed; when it is, however, vibrated by means of a movement in the caudal vertebræ of the bird, the distance of the tip of the feather is only about 4 inches from the centre of motion, and the same sound could not possibly be produced. I have tried the experiment, and have succeeded in making a sharp whizzing noise; but this by no means proves that, under the altered conditions which I have shown to exist, the bird can do the same. Mr. Hancock is of opinion that the sound is produced by the wings, which is a much more reasonable hypothesis, as most people are acquainted with the noise that the Lapwing unmistakably thus produces. Prior to reading Mr. Seebohm's notes on the ornithology of Siberia, and conversing with that gentleman on the subject, I was inclined to agree with Mr. Hancock; but I now consider that it is much more likely it is a combined vocal and mechanical sound produced by the bird's bill. He writes (Ibis, 1879, p. 157), concerning the Great or Double Snipe:—"Frequently I have sat partially concealed between a couple of willow bushes

attentively turning my glass on two or three pairs of these birds, all within 15 or 20 yards of me. They used to stretch out their necks, throw back the head almost onto the back, and open and shut their beaks rapidly, uttering a curious noise, like running one's finger along the edge of a comb. This was sometimes accompanied by a short flight or by the spreading of the wings and tail." This is by far the most important evidence ever published on the subject, and tends to show that the sound can be produced through the bill, in which case it could be easily heard high up in the air.

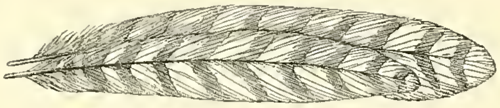
The accompanying woodcuts show the peculiar structure of the lateral tail-feathers in the last species, and the axillary feathers of both that and a young bird of the present species: in the old bird the bars at the tips of the feathers would be almost obsolete.



Axillary feathers of *G. stenura.*



Half-tail of *G. stenura.*



Axillary feathers of *G. scolopacina.*

GALLINAGO GALLINULA.

(THE JACK SNIPE.)

Scolopax gallinula, Linn. Syst. Nat. i. p. 244 (1766); Gould, B. of Europe, iv. pl. 322 (1837).

Gallinago minima (Ray), Sykes, Cat. B. Dukhun, P. Z. S. 1832, p. 163; Middendorff, Sibir. Reise, ii. p. 224 (1853).

Gallinago gallinula (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 272 (1849); Kelaart, Prodromus, Cat. p. 135 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 266; Schlegel, Mus. P.-B. *Scolopaces*, p. 14 (1864); Jerdon, B. of Ind. iii. p. 676 (1864); Beavan, Ibis, 1868, p. 393; Holdsw. P. Z. S. 1872, p. 472; Shelley, B. of Egypt, p. 249 (1872); Von Heuglin, Orn. N.Ost-Afr. p. 1206 (1873); Hume, Str. Feath. 1873, p. 235; Irby, B. of Gibraltar, p. 174 (1875); Blanford, Zool. Persia, p. 283 (1876); Butler & Hume, Str. Feath. 1876, p. 15; Fairbank, *t. c.* p. 263, et 1877, p. 410; Dresser, B. of Eur. pt. 57, 58 (1877); Hume, Str. Feath. 1878 (B. of Tenass.) p. 459; Blakiston & Pryer, Ibis, 1878, p. 222; Davidson & Wender, Str. Feath. 1878, vii. p. 88; Ball, *t. c.* p. 228; Cripps, *t. c.* p. 302; Hume (List B. of Ind.), ibid. 1879, p. 112.

Telmatias gallinula (Linn.), Saunders, Ibis, 1871, p. 389.

Limnocryptes gallinula (Linn.), Swinhoe, P. Z. S. 1871, p. 407; Gould, B. of Gt. Britain, iv. pl. 80 (1873).

La petite Bécassine ou la Sourde, Buffon; *Jack Snipe*, Latham; *Judock*, *Half Snipe*, vulg. in England; *Zweig-Sumpschnepfe*, *Moorschnepfe*, German; *Agachadiza*, *Agachadera*, Spanish (Saunders). *Kanisah*, Egypt (Von Heuglin); *Saiga* (Favier), Moorish.

Adult male and female. Length 8·5 to 9·65 inches; wing 4·1 to 4·5; tail 1·7 to 2·2; tarsus 0·9 to 0·95; middle toe 0·9 to 1·05; bill to gape 1·5 to 1·6. Weight $2\frac{1}{4}$ to $2\frac{1}{2}$ oz. (Welsh examples).

The above measurements are taken from a series of European, British (Welsh, measured in the flesh), and Asiatic examples, the largest specimen of which latter is from Isfahan, Persia. The following are the dimensions of a Ceylon-killed individual (Jaffna, Jan. 1878):—wing 4·4 inches; tail 2·2; tarsus 0·94; middle toe 1·03; bill at front 1·55.

This species has only 12 tail-feathers, the centre pair of which are pointed and exceed the rest; the lateral feathers are typical of the genus, curved inwards, and with rigid shafts.

Iris dark brown; bill—culmen clear yellow, sides livid brown, base beneath greenish, tips of both mandibles black; legs and feet greyish green, brownish on the joints; claws brown.

The bill becomes much pitted on drying up after death.

Summer plumage (Heligoland). Centre of the head and nape deep black, streaked with rufous, on either side of which is a rich buff stripe leading from the nostril over the eye to the nape, in the middle of which is a narrow black streak just above the eye; face buff, through the lores a broad brown stripe, and along the cheeks, from the gape, another one leading over the ears round to the nape; hind neck fulvous brown, lightly marked with black and tipped with whitish; scapulars long and lanceolate, very widely margined on one side with rich buff and on the other with deep green, the remainder of the feather black, beautifully variegated with rich rufous and edged with metallic green; back and rump purple, edged with white; upper tail-coverts like the scapulars, but the buff not so rich and slightly tinged with green; tail brown, the centre feathers pointed and exceeding the rest, and broadly margined with rufous-buff, the lateral feathers variegated with buff; wings brown, the lesser coverts margined with whitish, the median with rufous-buff; secondaries deeply tipped with whitish; outer webs of tertiaries rufous-buff, barred with black; outer web of first primary white at the base.

Chin whitish; fore neck brownish, the feathers edged with fulvous and on the sides of the chest centred with black; beneath from the chest to the under tail-coverts white, the latter with brownish-fulvous stripes; axillaries white, streaked slightly with pale brown; under wing white, the centres of the feathers pale brown.

Winter dress (Ceylon, January). Buff markings of the upper surface not so rich as in the above, and the purple and green lustre of the scapulars, tertials, and rump not so brilliant; the fulvous edgings of the tail-feathers are not so broad. This specimen, which I have compared with a series of English winter examples, is in good plumage, and is a pale type; the throat and the markings of the face and forehead are whiter than in many English specimens, and it is no doubt a fully-aged bird, as the axillaries are *pure white*.

Young nestling (coll. Dresser). Head and upper surface mingled rich rufous and black, the down tipped with white; centre of the forehead, lores, and cheeks black and rufous; a broad whitish stripe above and beneath the lores, the latter extending round the ear-coverts; chin whitish; beneath dark ferruginous brown. Bill enormous for the age of the bird, measuring at front 1·15.

Young, not quite fledged (Lapland). Plumage above much as in winter adults; but the buff lateral stripes more *rufous*, the scapulars barred with dark rufous and tipped with white; the wing-coverts broadly edged with fawn-white; fore neck (which is still in down) brownish. Bill at front 1·4 inch.

Plumage of first autumn (Wales): *female*. Colours of the back and wings not so rich as in the adult; the scapulars conspicuously tipped with white, the black bars narrower, and the rufous terminal portions mottled with black; margins of central tail-feathers dusky buff, stippled with brown; axillaries streaked with brown.

Obs. A marked difference in the *plumage* of this Snipe from that of its congeners consists in the head not having the central stripe, the tail being unbarred and the flanks wanting the transverse markings. As above remarked, the tail also differs structurally, and, in addition to this, the sternum has two emarginations, which combined characters caused Kaup to place it in a separate genus (*Lymnocryptes*). The bill, feet, and wings are those of the rest of the group, although the former is rather high at the base, and the nostril is more distant from the margin than in some. Taking these points into consideration, the Jack Snipe might not unreasonably be placed in the subgenus *Lymnocryptes*; but I prefer not to adopt it in the present work.

Distribution.—There is reason to believe that this little Snipe is an occasional seasonal straggler to the northern parts of Ceylon. Layard heard of its occurrence in the Jaffna district during his residence at Pt. Pedro, but does not appear to have procured it himself. I give here his note concerning it:—"The late Mr. V. Burleigh, of Jaffna, an ardent sportsman and beautiful bird-stuffer, told me that he used frequently to meet with them about Wally some years ago, but that of late he had not seen any. My own testimony only reaches to a bird I saw on the table, luckily with both bill and legs perfect, and this I feel convinced in my own mind was a Jack Snipe." Mr. Holdsworth included it in his Catalogue on this "sportsman's authority;" but up to that date he had not procured any further evidence as to its occurrence. Of late years it has, I believe, been not unfrequently shot in the extreme north of Ceylon. Mr. W. Murray, of the Ceylon Civil Service, informed me that he had killed it in the peninsula; and I have heard the same from other gentlemen. In January 1877 a specimen was shot by Mr. Smart, of the Civil Service, near Jaffna, and was satisfactorily identified but not preserved; in the following January, Mr. E. F. Hopkins, Police Magistrate at Jaffna, shot another, which, through the kindness of that gentleman, is now in my possession. There is no doubt that every year some few "Jacks" find their way to Ceylon, and are overlooked among the thousands of its larger relation that visit the island.

On the mainland it is pretty generally distributed, but is nowhere numerous. In the south of India we have the Rev. Dr. Fairbank's testimony to its visiting the Palanis in small numbers, and it was observed by him frequenting the vicinity of the Lake at Kodaikanal, which has an elevation of 7000 feet. In the Deccan it is said to be common, but less abundant than the European Snipe; and the above-mentioned gentleman observes that it frequents all marshy places in the Khandala district, occurring, however, only in small numbers. In the north-west it is recorded as common in Sindh in the cold season (*Hume*), rare about the Sambhur Lake, which is an unfavourable locality for all Snipe (*Adam*); common on the plains of Guzerat (*Butler*), and, according to Mr. Hume, it is likewise so throughout the surrounding region; but Major Hayes-Lloyd does

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not record it from Kattiawar. Its earliest date of arrival in this region, as noticed by Capt. Butler, is the 23rd of September; in Sindh, Major Le Messurier speaks of individuals being procured on the 3rd October. In parts of Bengal it is common, occurring locally and uncertainly as regards consecutive seasons. Mr. Hume notes that a *few* are daily brought into the Calcutta bird-market during the time of their visit. In Furreedpore a few couples are met with (*Cripps*); and at Barrackpore Captain Beavan noticed it about the middle of November. He remarks that it occurs frequently in some years and rarely in others. "I have seen it," he says, "in most abundance in a jheel at Berhampore, near Moorshedabad; but the species seems most erratic in its wanderings, and takes to certain spots, where one is sure to come across them year after year, while it entirely avoids just as likely-looking ground within a short distance." In the Bardwan district it has been procured by Mr. Brooks at Assensole. Eastward of the bay it becomes rarer. In Pegu it is now and then met with, says Mr. Oates, being far from common; to the more southern region of Tenasserim it is a straggler; but beyond this, in the peninsula, we have no record of its occurrence, and, unlike the two preceding species, it does not cross the water to the Andamans. Mr. Hume, writing of Tenasserim, says, "Captain Dodd, the Master-Attendant at Moulmein, has, on several occasions, shot Jack Snipe in the neighbourhood of that place. We have not ourselves seen specimens; but there is no doubt about this matter. Captain Bingham also shot one last season" (1877). From the data, therefore, to hand up to the present time we see that the Jaffna peninsula in Ceylon (lat. 9° 30′ to 9° 40′) is the most southerly Asiatic point of its migration; and this is about the same parallel which it reaches in North-eastern Africa.

On the eastern confines of Asia it is not at all common. Swinhoe does not record it from China, but only mentions it having been once obtained in Formosa. It was likewise not seen by Père David, who only quotes Swinhoe for its occurrence in Formosa.

Messrs. Blakiston and Pryer do not include this bird in their Japan list; but Mr. Whitely obtained a specimen at Hakodadi. From Central and Northern Asia we have but little information concerning its habitat. Dr. Scully did not observe it at Yarkand; it is likewise absent from Dr. Henderson's list ('Lahore to Yarkand'); but, on the other hand, in portions of Turkestan M. Severtzoff records it as occurring on passage, but not found above 4000 feet.

Its breeding-home, as far as Asia is concerned, is Northern Siberia; but it has not been observed by all naturalists who have visited that region. I find that Von Middendorff records it as breeding on the Boganida, in 70° N. lat., and he observed it there from the 8th of June until the 31st of August; but there is no mention made of it on the Ob by Dr. Finsch, nor on the Yenesay by Mr. Seebohm. In Palestine Canon Tristram met with it; and in Persia Mr. Blanford says it is common in suitable localities during the winter months.

On the continent of Europe it is a more plentiful bird, inhabiting the southern portions in winter, and breeding, according to Von Heuglin, from Central Germany northward to Scandinavia. It inhabits the Mediterranean islands, for in Corsica Mr. B. Wharton met with it; and in Sardinia it is, according to Mr. A. B. Brooke, common. It appears to be plentiful in Holland, which is a great Snipe-country; and it occurs in Heligoland on passage. To the British Isles it is a winter visitant; it has now and then been seen during the summer months; but its nest has never been found within our limits. Mr. Hancock has seen it at Prestwick Car in Northumberland at a time when Redshanks were nesting. In the south of Spain it is common; and near Seville Col. Irby records it as very numerous in certain localities. It appears to be distributed along the northern shores of Africa in a similar manner to the last species. Favier, as quoted by Col. Irby, states that it arrives in the Tangier district in November and leaves in February; and Mr. Gurney and Canon Tristram record it from Algiers. In Lower Egypt, Captain Shelley remarks that it is common, frequenting, like the last, the Fayoom and the lake at Erment; it was observed by him at Dendera as late as the 24th March. Von Heuglin has noticed it still later, namely, in the month of May, and is of opinion that it may perhaps breed in the Nile delta, as he obtained males in the spring with the organs developed. It was observed on the Blue Nile by Brehm and Vierthaler; and this is its most southerly African limit.

Habits.—This beautiful species, the smallest of its family, frequents marshy ground which is overgrown with thick grass, the boggy banks of small streams, sedgy morasses, and wet moors, where the turf is spongy; and in India is found with other Snipe in rice-fields, by the sides of jheels, and such-like places. It is noted

for its habit of lying close, being difficult to flush, taking short flights, and suddenly dropping again; when fired at and missed repeatedly, as I have seen happen, it refuses to leave the locality which it has selected, darting away each time with its extraordinary zigzag flight, circling round, and then twisting sideways, suddenly disappears in the grass. This irregularity in its flight makes it very difficult to hit. The speed with which it flies is not equal to that of its relations, but it is more than compensated for by the erratic course which it takes. It is not a sociable bird, as a rule, not more than two or three being found in the same locality, which are flushed at some little distance from one another; and it often occurs that it is the solitary occupant of some little morass. Col. Irby, however, observes that in Southern Spain (where its favourite haunts were the "ojos," or land-springs, at the edges of the marisma) it collected in little assemblies before migrating. He thus writes of it:—"Towards the end of February, Jack Snipes assemble together very much; and this gathering of them is a sure prelude to the general departure of most of the Snipes for the north. The greatest number of the present species that I ever saw anywhere was in some of the 'ojos' westward of Coria del Rio, near Seville; these circular spots, about 10 yards in diameter, are very muddy and sparingly covered with short sedge. Many of them held fifteen or a dozen Jack Snipe; and the often-cited but imaginary individual who is said to have found a single Jack Snipe afford him sport for months, until his friend unluckily killed it, would indeed, have been in happy hunting-grounds." In extensive swamps of the Delta of the Nile, Von Heuglin found it singly or in more or less scattered companies, frequenting places which were thickly overgrown with rushes, in both fresh and brackish water; and he remarks that in that locality it preferred the vicinity of the sea to affecting the sides of streams. In very hard weather it lies very close, even though it be feeding in a comparatively open spot, such as in running water at the edge of a stream, from which I have flushed it, and noticed it fly off rather heavily, with an even flight. Its diet sometimes consists of minute shellfish. I recently found the stomach of a specimen I skinned crammed with tiny bivalves, measuring one eighth of an inch in diameter, and which apparently belonged to the genus *Sphærium*.

Nidification.—In Europe the Jack Snipe breeds during the month of June, resorting to the great swamps in Lapland to nest. In 1853, Mr. Wolley, the celebrated oologist, found several nests in the great marsh of Muonioniska; he describes them as being "made loosely of little pieces of grass and *Equisetum* not at all woven together, with a few old leaves of the dwarf birch, placed in a dry sedgy or grassy spot close to more open swamps." The female sits so closely that it will almost suffer itself to be caught. Mr. Wolley writes with reference to the nests which he found:—"In the course of the day and night I found three more nests, and examined the birds of each. One allowed me to touch it with my hand before it rose; and another only got up when my foot was within 6 inches of it." The eggs are enormously large in proportion to the size of the bird, four of them being said to weigh $1\frac{1}{2}$ oz. I am indebted to Mr. Dresser for an opportunity of examining a small series of five which were collected in Lapland. They are stone-buff, with an olivaceous tinge on two, and are pyriform in shape, some more pointed than others at the small end; they are handsomely marked with large blotches and clouds of deep sepia, collected in some specimens in the form of a cap, and in others in a zone round the large end, besides which there are other tolerably large blots on the smaller half; under these lie blotches of bluish grey, which in one egg are very large and dark and take a transverse direction; at the larger end there are some fine dark pencillings in one or two examples. In size they vary in length from 1·47 to 1·55, and in breadth from 1·06 to 1·11.

During the breeding-season, the Jack Snipe makes a peculiar noise on the wing, which is considered to be akin to that made by the Common Snipe. Mr. Wolley, who discovered this habit, writes to Mr. Hewiston as follows concerning it:—"It was on the 17th of June 1853, in the great marsh of Muonioniska, that I first heard the Jack-Snipe, though at the time I could not at all guess what it was,—an extraordinary sound, unlike any thing I had heard before; I could not tell from what direction it came; and it filled me with a curious surprise. My Finnish interpreter thought it was a Capercally, and at that time I could not contradict him; but soon I found that it was a small bird gliding at a wild pace at a great height over the marsh. I know not how better to describe the noise than by likening it to the cantering of a horse in the distance, over a hard, hollow road; it came in fours with a similar cadence, and a like clear yet hollow sound. . . . . It was not long after I heard it that I ascertained that the remarkable hammering noise in the air was made by the Jack-Snipe."

Genus LIMOSA.

Bill very long, slightly recurved, the tip slender and flattened, the base high, and the culmen rounded there; nostrils linear, placed close to the margin, and slightly advanced from the gape; both mandibles grooved at the sides from the base to the tip. Wings long, the 1st quill the longest. Tail short and even. Legs long, the tibia bare much above the knee. Tarsus covered in front with transverse scales. Toes moderate, the hind toe well-developed; outer and middle toe connected at the base by a web; middle claw dilated, *recurved*, and pectinated on its inner edge.

Summer plumage differing from that of winter.

LIMOSA ÆGOCEPHALA.

(THE BLACK-TAILED GODWIT.)

Scolopax ægocephala, Linn. Syst. Nat. i. p. 246 (1766).

Scolopax limosa, Gm. Syst. Nat. i. p. 666 (1788).

Limosa melanura, Leisler, Nachtr. Bechst. ii. pp. 150, 157 (1811–15); Gould, B. of Eur. iv. pl. 305 (1837); id. B. of Gt. Brit. iv. pl. 50 (1873).

Limosa ægocephala (L.), Blyth, Cat. B. Mus. A. S. B. p. 268 (1849); Von Middendorff, Sibir. Reise, ii. p. 218 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Jerdon, B. of Ind. iii. p. 681 (1864); Holdsw. P. Z. S. 1872, p. 473; Shelley, B. of Egypt, p. 245 (1872); Sharpe & Dresser, B. of Eur. pt. 15 (1872); Hume, Str. Feath. 1873, p. 235; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1153 (1874); Irby, B. of Gibraltar, p. 169 (1875); Oates, Str. Feath. 1875, p. 346; Butler & Hume, ibid. 1876, p. 16; Seebohm & Harvie Brown, Ibis, 1876, p. 202; Blanford, Zool. Persia, p. 283 (1876); Ramsay, Ibis, 1877, p. 469; Hume, Str. Feath. 1878 (B. of Tenass.), p. 460; Cripps, ibid. vii. p. 302; Hume, *t. c.* p. 486; id. ibid. 1879 (List of Ind. B.), p. 112.

La grande Barge rousse, Buffon, Pl. Enl. 916; *Jadreka Snipe*; *Red Godwit*, Lath.; *Small Godwit* of some. *Gairiya* also *Burra Chaha*, Hind.; *Jaurali*, Bengal.; *Tondu ulanka*, Telegu (Jerdon); *Tchibib*, Moorish (Favier); *Abujeta*, Andalucia (Irby); *El aqát*, *Biqa* or *Biqa el Sultani*, Arabic (Von Heuglin).

Adult female (Sambhur). "Length 15·8 inches" (*Adam*); wing (imperfect) 8·2?; tail 3·5; tarsus 3·0; bare tibia 2·0; middle toe 1·45, its claw 0·4; bill at front 4·0.

Adult male (Asia Minor). Wing 8·4 inches; tail 3·0; bare tibia 1·8; tarsus 3·1; middle toe with claw 1·8; bill at front 4·1.

Obs. This species varies very much in size. Females as a rule are larger than males. A series of Furreedpore examples measured by Mr. Cripps range, in the wing from 7·5 to 7·92 inches, in the tarsus from 2·75 to 3·08, in the bill, at front, from 3·6 to 4·39, and in weight from 8·6 to 12·12 oz. Except in the latter point, the margin of difference is not so great here; but elsewhere, in 'The Ibis,' 1873, Messrs. Alston and Harvie Brown notice a specimen in the Archangel Museum with the wing 9·0 inches, tarsus 3·8, bill to gape 4·87.

Iris dark brown; bill fleshy red, darkening to brown at the tip, the culmen brownish; legs and feet blackish.

Winter plumage (Sambhur). Head, hind neck, interscapulars, scapulars, tertials, and median wing-coverts pale earthy

brown, lightest on the head and hind neck, and darkening on the lower back into dark brown, the edges of the feathers throughout paler than the rest; lesser wing-coverts, primaries and their coverts, terminal portion of the secondaries and greater coverts blackish brown, the two latter and the primary-coverts darker than the primaries; rest of the secondaries, terminal portion of the greater coverts, tips of the primary-coverts, and more than the basal half of the primaries, together with the upper tail-coverts and basal half and tip of the tail, pure white; remainder of the tail black, decreasing towards the lateral feather, which is all white except about half an inch; extreme tips of the primaries white; a whitish stripe from the bill over the eye, a narrow dark orbital fringe; lores dark brown; chin, face, and throat whitish; fore neck pervaded with greyish, the bases of the feathers dark brown; under surface, axillaries, and under wing white, sullied on the upper breast with greyish; feathers beneath the ulna dark brown.

Summer plumage, male (coll. Dresser). Head, entire neck, and sides of chest rufous, the feathers of the head with broad central black-brown stripes, diminishing on the hind neck and increasing again on the lower part, and expanding into broad central bars on the upper back and scapulars, the latter of which parts are likewise barred with rufous; tertials barred with black and rufous; face finely streaked with brown; the chest and flanks barred with black; the rufous colour on the flanks only present as an edging to the black bands; a few black bars on the under tail-coverts and abdomen; lower back and terminal half of the upper tail-coverts black; tail as in winter.

Female. "Differs from the male in having the colours on the head and neck much duller; the back is devoid of the rich ferruginous and black markings, and is dull earthy grey, marked here and there with black and rufous, the scapulars and innermost secondaries are only to a small extent marked with black and ferruginous, as in the male; the feathers on the breast are duller in colour, and have the black bars only very irregularly defined; and the rest of the underparts are much whiter and less barred than in the male." (*Dresser.*)

Young, nestling in down. "Rusty yellow, marked with black, especially on the crown and rump; a narrow streak through the eye, wing-joints, cheeks, and belly light yellow." (*Id. fide* Meves).

Immature. Young birds differ from the adult in winter in having the scapulars and tertials edged and indented with rufous-buff, the wing-coverts margined and edged with white, and the head-feathers edged with buff; back blackish brown.

Obs. The Bar-tailed Godwit, *L. lapponica*, which is found in North India, may possibly wander as far south as Ceylon. It has the tail greyish white, in winter barred with brown; rump pure white as a rule, though specimens are sometimes found with this part marked with brown. The axillaries *are barred with blackish grey* instead of being pure white.

Limosa brevipes, Gray, the Australian Black-tailed Godwit, is a small race of the present species. An Amoy specimen before me measures in the wing 7·3 inches, bill at front 3·1. It is in summer plumage, and differs somewhat from *L. ægocephala*; the chin is white, and the breast pale rufous barred with blackish, the bands being continued down upon the flanks, and the ground-colour of the lower parts is brownish grey.

Other species are:—*L. novæ-zealandiæ*, the Chinese and Australian representative of *L. lapponica*, differs in having the rump and upper tail-coverts barred with brown; *Limosa fedoa*, Linn., and *L. hudsonica* are American species.

It will be well to notice here, curtly, the remarkable form *Pseudoscolopax semipalmatus*, the Snipe-billed Godwit, which forms a link between the Snipes and the genus under consideration. This rare and interesting bird, which Mr. Hume suggests may be a vanishing species (but which I hope may not be the case), was procured once (the type) by Jerdon at Madras, so that it may some day wander as far south as Ceylon. The bill is that of a Snipe. The feet are partially webbed, and the legs are longer than those of a Snipe, while the plumage is like that of a Godwit. Mr. Hume has recently obtained three specimens in the Calcutta market, of which he records the dimensions as follows:—Length 13·0 to 13·3 inches; wing 6·75 to 7·1; tarsus 2·0 to 2·2; tail 2·4 to 2·6; middle toe and claw 1·48 to 1·58; bill from gape 2·89 to 3·1: weight 3·9 to 4·1 oz.

The above-mentioned group of birds, combined with the next species, the Avocet Sandpiper (*Terekia cinerea*), form the subfamily Limosinæ of some authors.

Distribution.—The Black-tailed Godwit may perhaps be a not unfrequent cool-season straggler to Ceylon. I have never met with it, nor have I seen any examples which have been procured in the island since

Layard's time. This naturalist records the shooting of a pair at Point Pedro in April; and these specimens are now extant in the Poole collection. It should be looked for in future by gentlemen collecting on the shores of the Jaffna peninsula. It is a common bird in India during the cool season, but is, on the whole, more confined to the north than the south, and, like some other "Waders," I imagine it is more numerous in some seasons than others. It is to be found in the maritime regions at the mouths of rivers and on the muddy flats surrounding salt lagoons and backwaters. In the Calcutta district it is common at the beginning and end of the cool season, but in the interior very few are seen. In Furreedpore Mr. Cripps noticed numbers at a sheet of water in some large paddy-fields in March; but by the beginning of April "not a bird was to be seen." In Pegu it was not noticed by Mr. Oates; but he writes that numerous flocks frequent the mud flats at the mouth of the Sittang. Further south in Tenasserim the limit of its range, as yet ascertained, is Moulmein, whence Mr. Hume records a single specimen. It was only once seen in Burmah, at Tonghoo (?), by Capt. Wardlaw Ramsay, and is therefore a very local bird on the east side of the Bay. As regards the north-west, Capt. Butler states that it is common in marshy land and about tanks near Deesa; and at the Sambhur Lake it is to be found in large flocks. In Kattiawar it is reported to be common in the winter. Elsewhere on the banks of the Indus and on the larger rivers of the Punjab it was occasionally observed by Mr. Hume; and in the swamps and broads of Sindh it was seen by him in large flocks. Individuals which, as in the case of other Waders, are barren and non-migratory birds have been noticed at Kurrachee during the breeding-season. In Persia Mr. Blanford obtained it at the mouth of the Euphrates, and says that it is found on the Caspian. In Turkestan Severtzoff says that it occurs on passage in the north-western district, which extends up to the sea of Aral, and breeds on the salt plains and other lands up to 1000 feet in elevation. Mr. Dresser remarks that "Dr. Radde observed large flocks in Siberia, at Tarei-nor, on the 12th of May, 1856, but lost sight of them during the summer. At Altansk, on the 30th of July, large flocks of old and young birds had collected preparatory to leaving." Von Middendorff found a Godwit breeding on the Schantar Island, in the sea of Okhotsk; but it is not quite clear whether it was this species or the smaller *L. brevipes*, which inhabits China, the Malay archipelago, and Australia. Prjevalsky records this latter species only, under the title of *L. melanuroides*, from South-east Mongolia, and so do Messrs. David and Swinhoe from China; it therefore appears that the present bird does not range to the eastern coasts of Asia.

Turning to Europe we find this Godwit extending in summer as far north as the White Sea, where it doubtless breeds. In Greece and the Ionian Islands it occurs in winter; but elsewhere, in Sicily, Sardinia, and in Italy, it is a bird of passage in spring and autumn. It breeds commonly in Holland, also in Denmark, Silesia, and in Scandinavia. Until of late years it used to nest in Norfolk and Cambridgeshire, and also in Lincolnshire; but it has now become a mere visitant, and is often obtained in spring and autumn. It is a winter visitant to Scotland, but does not occur in Ireland. According to Sabanäeff it breeds on the western slopes of the Ural as high as $58\frac{1}{2}°$ N. lat.; it is common in the valleys of South-eastern Perm, and probably breeds, he says, in the Kamishlovsky district. Although it is, as stated, a bird of passage in the Mediterranean region, it is said, on the authority of Von Homeyer, to breed on the Ballearic Isles. In Spain, writes Mr. Saunders, it is not uncommon in winter and abundant in March on passage; and in Andalucia Col. Irby says that it appears in February in bands of from four or five to two or three hundred in number, frequenting the grassy marshes or inundated ground about Casa Vieja and the marismas; its numbers vary considerably in different years, but by the end of March their passage is nearly over, and at that time they are "well advanced in their rufous breeding-plumage." Immense quantities are brought into the Seville market in March; and this author likewise states that some few birds are found in the winter in Andalucia. It is stated to be common in Portugal. In Morocco Favier records, in his MS. notes, that "it is found on passage near Tangier in abundant flocks, migrating to the north during the months of February and March; they are observed returning in August and September." As regards Egypt, Captain Shelley writes that it is "a winter visitant, ranging throughout Egypt and Nubia, and is by no means uncommon in Lower Egypt and the Fayoom, where I frequently shot it." Von Heuglin states that while many remain in Central Egypt and in the Nile delta after their arrival in September, others ascend the Nile and its tributaries as far as the Kordofan swamps and the Blue and White Nile to about latitude 12°. He saw numbers at the Tana Lake in Abyssinia, and met with solitary individuals until the middle of May, so that he thinks it not impossible that many Godwits may pass the summer there. I do not find it recorded from the west coast of Africa; but it has been obtained in

the Canaries and, according to Von Heuglin, in Madeira. It has also been obtained in the Faroe Islands, is said to be common in Iceland, and has on one single occasion been procured in Greenland, from which remote region it was recorded by Professor Baird in 'The Ibis,' 1867, p. 282.

Habits.—The Small Godwit, like its congeners, inhabits by choice the vicinity of the sea-shore, frequenting sand banks, mud flats, and tidal estuaries; but it is often found on freshwater marshes, flooded lands, the borders of large rivers, margins of lakes, and other such favourite localities as Waders usually resort to. It assembles in flocks more than most large shore birds, and moves about a good deal, not remaining many days in the same locality. Col. Irby states that they are very restless, shy, and difficult to get within shot of, and that the best way of obtaining them is to lie up for them or ride a stalking-horse. By this expedient I have known many birds, more especially Bustards, to be shot when no other plan succeeded. Captain Shelley, who often saw it alone, says that it feeds in company with Redshanks, Ruffs, and other Waders, but when on the wing keeps separate from them. At times it associates with small Waders, such as Stints. When not feeding it stands erect, with the neck drawn back and the bill horizontal, and thus assumes the position of an Egret. Messrs. Seebohm and Harvie Brown particularly remark upon this attitude in their paper on the birds of the Petchora River. In the breeding-season it is very noisy; and Pallas likens its note at that time to the neighing of a foal. Its flesh is said to be excellent eating.

Nidification.—Nothing is recorded of the nesting of this Godwit in Asia; but in Europe its breeding-habits are well known. Dr. Taczanowski, of Warsaw, writes an interesting account of the species as observed on the Vistula to Mr. Dresser, from whose work I transcribe the following passage:—"Usually they begin breeding early in May, and about the middle of June young may be found fully fledged. They generally breed in large societies, in tolerably damp places covered with high thin herbage where there are tussocks or small dry places, but also in the fields (in scattered pairs or small colonies) and in small marshes covered with grass and bushes. On the top of a tussock or a dry place they make a depression about 3 inches deep, and line it carefully and neatly with dry grass, depositing four eggs, which both male and female sit on. If a human being approach their nesting-colony, they meet him when some distance from it, uttering loud cries, and returning again and again in larger numbers as he comes nearer to their nests. When he is amongst the nests all the birds fly overhead uttering a continued lamentation. If the intruder remains there any time, they become tamer, and a few return to their eggs, especially if the latter are hard-set. Before they have eggs they are very shy, rarely approaching within gunshot; but when the young are hatched they are most courageous, and will come within a few feet of the intruder, not even retreating when fired at, and dozens may be killed. They will attack a cow or horse if they approach their breeding-places, and attack and pursue any bird of prey or Crow that may pass near. When the young have attained a good size the parents take them to some other place, generally to the fields or shores of the lakes, where they assemble from all parts, and leave when old enough to do so."

From an examination of a series in Mr. Dresser's collection, many of them purchased in Leadenhall Market and procured in Holland, I find that the eggs of the Black-tailed Godwit are unlike those of most species of this family. They are of a pure olive tint, some browner than others, and are rather scantily marked with dusky brownish and olive-brown, in some eggs in the form of clouds, and in others of blotches and spots, very light in some, and more pronounced in others; dusky grey, lightly indicated clouds underlie the upper markings. They are pyriform in shape and broad at the large end. They measure 2·14 by 1·54 inch, 2·24 by 1·53, and 1·94 by 1·48.

Genus TEREKIA.

Bill long, slender, recurved, somewhat widened at the base; both mandibles grooved, as in *Limosa*; the tip flattened and bent down; nostrils as in the last genus. Wings long, reaching to the end of the tail, the 1st quill the longest. Tail of 12 feathers, short, cuneate. Legs rather short; tarsus longer than the middle toe and claw, covered in front with narrow transverse scales; anterior toes joined at the base by a web, most developed between the outer and middle one, and which extends along the sides in a narrow membrane; claws short and wide.

Summer plumage differing slightly from the winter.

TEREKIA CINEREA.

(THE TEREK SANDPIPER.)

Scolopax cinerea, Güld. N. Comm. Acad. Sci. Imp. Petrop. xix. p. 473, tab. xix. (1774).

Scolopax terek, Lath. Ind. Orn. ii. p. 724 (1790).

Totanus javanicus, Horsf. Trans. Linn. Soc. xiii. p. 193 (1822, descr. orig.).

Scolopax sumatrana, Raffles, Trans. Linn. Soc. xiii. p. 327 (1822).

Numenius cinereus, Bonn. et Vieill. Enc. Méth. iii. p. 1157 (1823, descr. orig.).

Limosa cinerea (Güld.), Von Middendorff, Sibir. Reise, ii. p. 216 (1853); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1157 (1874).

Limosa terek (Lath.), Gould, B. of Eur. iv. pl. 307 (1857).

Terekia cinerea (Güld.), Gray, Gen. B. p. 88 (1846); Gould, B. of Austral. vi. pl. 34 (1848); Blyth, Cat. B. Mus. A. S. B. p. 267 (1849); Jerdon, B. of Ind. iii. p. 682 (1864); Gould, Handb. B. of Austral. ii. p. 261 (1865); Blanford, Zool. Abyssin. p. 433 (1870); Swinhoe, P. Z. S. 1871, p. 406; Layard, B. of S. Afr. no. 609 (1867); Sharpe & Dresser, B. Eur. pt. 4 (1871); Holdsw. P. Z. S. 1872, p. 474 (first record from Ceylon); Hume, Str. Feath. 1873, p. 237; id. ibid. 1874, p. 296; Salvadori, Ucc. di Borneo, p. 330 (1874); Butler & Hume, Str. Feath. 1876, p. 16; Ball, *t. c.* p. 236; Armstrong, *t. c.* p. 341; Blanford, Zool. Persia, p. 283 (1876); Sclater & Taylor, Ibis, 1876, p. 64; Seebohm & Harvie Brown, *t. c.* p. 292; Butler, Str. Feath. 1877, p. 223; Hume, ibid. 1878 (B. of Tenass.), p. 460; id. ibid. vii. p. 480; id. 1879 (List B. Malay Penin.), p. 70, et p. 112 (List B. of Ind.); Seebohm, Ibis, 1879, p. 152.

Xenus cinereus, Güld., Alston & Harvie Brown, Ibis, 1873, p. 68.

Terek Avoset, Penn. Arctic Zool.; *Terek Snipe*, Lath.; *Terek Godwit*, Gould; *Avocet Sandpiper* of some authors; *Terek-Schnepfe*, German; *Kulēek*, Russian. *Kaukale*, Amurland (Schrenck); *Kooning kaki*, Sumatra; *Bedaran*, *Choweyan*, Java (Horsf.).

Adult females (December to Feb., Kurrachee). Wing 5·1 to 5·18 inches; tail 2·3 to 2·4; tarsus 1·08 to 1·1; middle toe 0·85 to 0·87; bill at front 1·85 to 1·95, to gape 1·98 to 2·01.

The above measurements are from specimens in my own collection. A *male* recorded from Sambalpur by Mr. Ball is measured by him as follows:—wing 4·9 inches; tail 2·2; tarsus 1·1; bill at front 2·2. Mr. Hume notes the dimensions of a series of females from Kurrachee and the Mekran coast as:—length 10·0 to 10·5 inches; wing 5·1

to 5·2, expanse 17·0 to 17·25; tail 2·0 to 2·5; tarsus 1·1 to 1·15; bill at front 1·75 to 2·0. The bill varies much in length; Schrenck gives that of an Amoor-river example at 1·54 (1 inch 6½ lines).

Iris brown; bill blackish brown, orange-yellow at base; legs and feet orange-yellow.

Winter plumage (December, Kurrachee). Head, hind neck, back, scapulars, tertials, inner median and greater coverts, and tail grey-brown, the feathers with dark shaft-lines, and the shorter scapulars blackish brown at the centre, blending into the surrounding paler colour; margins of the upper tail-coverts and rump-feathers whitish, with an inner border of darker brown than the rest of the feather; lesser, outer median and greater, and the primary-coverts dark brown; primaries the same, the first shaft and the inner edges of the feathers white; secondaries dark brown, with most of the inner webs and the tips white, this colour including the terminal half inch of the outer webs; tips of the inner primaries white; the three lateral tail-feathers with white inner and outer margins, occupying most of the outer web of the lateral one; forehead, eye-stripe, and front of face whitish; lores brownish: ear-coverts striped with brown, with a whitish patch just above; throat and under surface white; fore neck, except just down the centre, with narrow brownish shaft-lines; under wing and axillaries white, the bases of the feathers along the edge brown.

A February specimen has the shorter scapulars with more brown, and it is continued in rather narrow shaft-stripes to the longer feathers.

Summer plumage. Asiatic and European birds both show the same insignificant change in the plumage during the breeding-season; and examples in Mr. Dresser's collection correspond with Chinese specimens. A Shanghai example in the Swinhoe collection (3rd May) differs but little from the above winter specimens; the plumage is slightly darker, and the shaft-stripes on the interscapular region are bolder, and the dark spear-shaped centres of the shorter scapulars are blacker and extend in moderately broad stripes to the longer feathers; dark brown feathers are appearing on the interscapular region; the upper tail-coverts are pencilled and indented with dark brown, and the fore neck and chest have narrow mesial brown stripes on the feathers. This is the commencement of the summer plumage, which seems to be acquired by a change in the colour of the feathers, combined with a partial moult, as is the case with the rest of the family.

Mr. Ball remarks, with regard to the above-mentioned specimen (May), that it shows no approach to the summer plumage; but Mr. Swinhoe instances an example (16th April) killed at Shanghai which is in summer plumage; it is probable, however, that this bird is no further advanced than the one just described.

Young nestling, in down (coll. Dresser). Buff-grey above, mottled and marked with black, principally down the back; a bold stripe through the lores, continued behind the eye; sides of the rump marked with black; a stripe over the crown. There are no very characteristic markings in this nestling. Bill at front 0·4 inch.

Distribution.—This curious Sandpiper is a comparatively recent addition to the avifauna of Ceylon, as it had not been noticed in the island prior to Mr. Holdsworth's meeting with it. He chronicles his discovery as follows:—"I obtained one specimen in winter plumage, out of a flock of five, in April 1869; they were in a small swamp near the sea at Aripu." It is perhaps a frequent *straggler* to Ceylon in the cool weather, arriving and departing unnoticed, as small Waders are but little shot in the north.

It is a bird of singular distribution, being scattered more or less over Asia, extending to Australia; Eastern Europe and Eastern Africa are taken into its range, but it avoids the western side of both continents. It is not generally diffused throughout India, being for the most part a shore-bird. Jerdon writes as follows concerning it:—"This neat-plumaged little Sandpiper is not very abundant in the south of India, but is met with more frequently towards the north." Mr. Ball records but one specimen from the coast of the Orissa Province; and Mr. Hume has only once met with it in the Calcutta market, when an entire flock of fifty had been netted. From Burmah it is not recorded; and in Tenasserim it is found rarely along the coast and creeks of the central portion of the province. Mr. Davison obtained it at Amherst, Thatone, and Tavoy; and he likewise met with it commonly about Port Blair, in the Andamans, but did not see it in the Nicobar group. In the north-west of India it is a common bird on the sea-coast in some parts. In Kurrachee harbour and on the Mekran coast Mr. Hume found it abundant. Turning eastward again, in which direction it has a wide range towards the south, we find it recorded from Kopah, in the Malay Peninsula, as also from Java and Sumatra, in the former of which several naturalists, including Horsfield, procured it, and in the latter Raffles observed it, and, taking it for a new species, described it under the name of *Scolopax sumatrana*. In Borneo it has been obtained in Sarawak.

Bernstein procured it in the islands of Morotai and Halmahera. It wanders south to Australia, where Mr. Ramsay records it from the Wide-Bay district and from New South Wales; but, as in the case of *Totanus glottis*, it is omitted in his "Distribution" list from Tasmania, where it was procured by Mons. Labillardière (*Sharpe & Dresser*). Gould obtained a specimen on the river Mokai, in New South Wales, on the 12th of July, 1839. Its migration to Australia and the Malay Archipelago must take place from North-eastern Siberia by way of China, where Swinhoe records it only from Tientsin and Shanghai; he does not seem to have met with it as often as might have been expected, and its scarcity there shows that it is not a very abundant species; but it is a great straggler during the winter season. The same is observable on the western confines of its habitat, as it is far from being abundant down the eastern side of Africa. It has been obtained in Japan by Siebold. Von Middendorff met with large flocks, some of them containing fifty individuals, at the end of June, on the south coast of Okhotsk; but they were not about to breed and were in winter plumage. This seems to have been an assembly of first-year birds, to which we have a parallel in Mr. Hume's account of a flock of fifty being netted at Calcutta at once. Schrenck procured it on the Amoor river; and Mr. Seebohm reports it as common on the Yenesay as far north as lat. 70° in the breeding-season; and Dr. Finsch met with it in North-west Siberia, near Kara Bay, on the 20th of July. In Western Asia it does not appear to be widely distributed. Severtzoff does not record it from Turkestan, it being almost the only member of the Asiatic Scolopacidæ which he does not notice; and Mr. Blanford only includes it in his list of Persian birds as having occurred in one locality—Enzeli, on the Caspian, where Filippi met with it. It was not until the summer of 1875 that it was heard of in Turkey, where a pair were shot near the Sweet Waters by a Mr. Pearson; and it was unknown in Italy until three were shot in the neighbourhood of Pisa in May 1869, and the occurrence published shortly afterwards by Salvadori. Messrs. Sharpe and Dresser state that though it breeds plentifully in Northern Russia, it seldom visits any other part of Europe.

Messrs. Alston and Harvie Brown found it abundant in the delta of the Dwina and on islands near Archangel; and Mr. Seebohm and the latter gentleman met with it, but not in such numbers, on the Petchora.

It has seldom occurred in Sweden, and is unknown in Great Britain and Spain, though it has been procured in France. Down the eastern side of Africa it is a mere straggler. Neither Shelley or Von Heuglin record it; but Mr. Blanford met with an example on the coast of the Gulf of Adulis, and it has been shot on the Arabian coast of the Red Sea. In the south it was obtained in Madagascar by Pollen, which is a great proof of its wandering nature. Layard does not seem to have met with it in Cape Colony, and merely instances a specimen having been shot in Natal by Mr. Ayres.

Habit.—The exact position of the Avocet Sandpiper among the Scolopacidæ has been a matter of dispute. Its curved bill has caused some to place it in the genus *Limosa* as a Godwit; while others, looking at its short legs, its note, and general habits, and the character of its eggs, maintain that it is more nearly allied to the Totanine section of the Sandpipers; and this would seem to me to be its proper location. It is, in fact, a slightly aberrant member of the *Totanus* group, and constitutes a link between it and the Godwits. It frequents the shores of bays, the mouths of rivers, the edges of salt lakes and lagoons, and, except in the breeding-season, does not seem to affect ordinarily the vicinity of fresh water. It is often met with in small troops of from three to six or seven, but has also a tendency to pack in flocks, probably before and during its migration. Von Middendorff remarks that when wounded it swam and dived perfectly; its webbed feet, as a matter of fact, are adapted to make it quite at home on water. When separated by the approach of danger, he says it gave out a piping note, which led him to believe it was one of the *Totanus* group. In its breeding-haunts on the Petchora Mr. Seebohm notices that it is "extremely fond of running over the bits of floating drift-wood on the submerged outskirts of the forest, uttering its musical *tir-r-r-whui.*" Messrs. Alston and Harvie Brown write that they "were much struck by the arboreal habits of this species, which perches freely upon bushes or low trees, and runs along the branches with great ease, uttering a rapidly repeated cry of alarm, which may be expressed by the words *tluk, tluk, tluk.* When first started, or when flying from place to place, or dashing in and out amongst the alder thickets, the more musical double note is uttered, whence its Russian name of 'Kuleek.'" I find some further interesting and more detailed notes on the Terek Sandpiper's habits, as observed in Northern Russia, transcribed by Messrs. Sharpe and Dresser from the writings of Baron Count von Hoffmannsegg and K. G. Henke in the 'Allg. deutsche natur. Zeitung' for 1856; and from these I subjoin

the following extract:—"The note of the male, which is probably its pairing-call, is clear, loud, and full from the throat. It is uttered, and often repeated, from a stone, root of a tree, a hillock, or any similar elevated position, the bird moving its body and apparently exerting itself in calling. The note is of three syllables, and sounds like *kuwitzzüü, kuwitzzzüü, kuwitzzzüü*, or also *gizzüüüd, gizzzüü, gizzüüd*, the last syllable always rising higher and being more drawn out; sometimes a low, flute-like, melancholy note (*hahiaaa, hahiaaa, hahiaaa*) is uttered immediately after, when the former call has been often repeated. . . . . The peasants call the bird, very correctly, after its note, *Kuwitri*, whereas they scarcely distinguish the other species of long-billed Sandpipers."

Nidification.—The Terek Sandpiper breeds in Northern Siberia and Northern Russia, but not south of lat. 60°; and it has been observed as high as lat. 70°. The latest notes which have been published on its breeding are those from the pens of Messrs. Alston and Harvie Brown, who were so fortunate as to find it nesting in abundance at the mouth of the Dwina in June 1872. These gentlemen describe the nest as "simply a slight saucer-shaped hollow in the ground, lined with chips of wood and bits of thick reed, and is placed in open marshy parts of the alder thickets, by the sides of 'Kourias' or creeks, or in the sand amongst bent grass."

The eggs of this species are pointed ovals in shape, and of a stone-yellow ground-colour for the most part, though some are browner than others. They are rather openly marked with blotches of dark sepia over faded spots of purple and bluish grey of several shades, which in some cases blends with the large blots of brown. Some eggs are distantly marked, while in others the colouring is chiefly at the large end in the form of softened irregular clouds. In one or two specimens before me there are a few pencillings or streaks intermixed with the blotches, making the eggs decidedly handsome. Some measure 1·47 by 1·0 inch, others 1·55 by 1·08 and 1·4 by 1·06. The series here described are in the collection of Mr. Dresser. Messrs. Alston and Harvie Brown rightly observe that the eggs in many instances resemble those of the Common Sandpiper, and further remark that they bear no resemblance to those of *Limosa*.

Genus TOTANUS *.

Bill long or moderately so, slender, straight, in some slightly recurved; both mandibles channelled in the basal half, the lower faintly so; nostrils linear, placed near the margin, tip of the upper mandible slightly bent. Wings long and pointed, the 1st quill the longest; tertials lengthened. Tail moderately short, scarcely exceeding the closed wings, rounded at the tip. Legs long; the toes connected at the base by a small web, most developed between the outer and the middle toe.

Sternum, as in other Scolopacine groups, variable, but usually with two emarginations or open foramina.

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* The present genus comprises a number of birds bearing, in outward form, a general resemblance to one another, but almost all differing from each other in some point, either as regards bill and feet, or change of plumage in summer. The most aberrant forms under consideration in this work are:—the first, by reason of its bill and the single notch in the sternum; the Common Redshank, on account of its highly-webbed feet; and the Green Sandpiper, as also possessing a single emargination in the sternum and a very abnormal mode of nidification.

TOTANUS GLOTTIS.

(THE GREENSHANK.)

Scolopax glottis, Linn. Syst. Nat. i. p. 245 (1766).

Scolopax canescens, Gm. ed. Syst. Nat. i. p. 668 (1788).

Totanus glottis, Bechst. Orn. Taschen. Deutschl. ii. p. 287 (1803); Gould, B. of Eur. iv. pl. 312 (1837); Horsf. Tr. Linn. Soc. xiii. p. 192 (1821); Blyth, Cat. B. Mus. A. S. B. p. 265 (1849); Middendorff, Sibir. Reise, p. 213 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Schlegel, Mus. P.-B. *Scolopaces*, p. 61 (1864); Jerdon, B. of Ind. iii. p. 700 (1864); Blyth, Ibis, 1867, p. 169; Newton, *t. c.* p. 351; Swinhoe, P. Z. S. 1871, p. 405; Holdsw. P. Z. S. 1872, p. 475; Ball, Str. Feath. 1874, p. 431; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1169 (1874); Salvadori, Ucc. di Born. p. 328 (1874); Legge, Ibis, 1875, p. 402; Walden, Tr. Z. S. 1875, ix. p. 234; Butler & Hume, Str. Feath. 1876, p. 18; Hume, ibid. 1878 (B. of Tenass.), p. 463; Ball, ibid. vii. p. 229; Cripps, *t. c.* p. 304; Hume, ibid. 1879 (List Ind. B.) p. 113.

Totanus glottoides, Vig. P. Z. S. 1831, p. 172; Gould, Cent. Him. B. pl. 76 (1832); Kelaart, Prodromus, Cat. p. 134 (1852).

Limosa glottoides (Vig.), Sykes, P. Z. S. 1832, p. 163.

Totanus horsfieldi, Gray, Gen. B. iii. p. 573 (1846).

Glottis glottoides (Vig.), Gould, B. of Austr. vi. pl. 36 (1848); id. Handb. B. of Austr. ii. p. 265 (1865).

Totanus canescens (Gm.), Adams, P. Z. S. 1859, p. 169; Sharpe & Dresser, B. of Eur. pt. 5 (1871); Shelley, B. of Egypt, p. 256 (1872); Hume, Str. Feath. 1873, p. 247, et 1874, p. 299; Irby, B. of Gibraltar, p. 165 (1875); Scully, Str. Feath. 1876, p. 189; Armstrong, *t. c.* p. 344; Hume, *t. e.* p. 465.

Cinereous Godwit, Latham; *der hellfarbige Wasserläufer*, German. *Mashak yamgurchi*, Turki (Scully); *Aoashi-chidori*, Japanese (Blakiston); *Timtimma, Tuntuna*, Hind., from its call; *Gotra*, Bengal. (Jerdon); *Peria kotan*, Tamil; *Maha oliya*, Sinhalese.

Adult male and female (Ceylon). Length 13·5 to 14·4 inches; wing 7·5 to 7·9; tail 3·3 to 3·5; tarsus 2·5 to 2·7; bare tibia 1·1 to 1·4; middle toe and claw 1·5 to 1·6; bill to gape 2·45 to 2·5.

Iris light brown; bill bluish leaden at base, changing to brownish towards the tip, in some dusky plumbeous throughout, with the base beneath bluish; legs and feet bluish leaden, the toes and tibia somewhat greenish, in some greenish blue, with the lower part of tarsus only bluish.

Winter. Head, hind neck, upper back, scapulars, tertials, and wing-coverts cinereous brown; the feathers, except on the head and neck (where they are broadly edged with white), with dark shafts, and a row of marginal alternate dark and white spots, formed by the light edges being indented with darker brown than the feather: on the interscapular region the edgings are whitish, with an inner margin of brown; longer scapulars and tertials overcast with a greyish brown, very strong in the newly-moulted feather; centre tail-feathers white at the base, washed towards the tip with ashy grey, the rest white, barred and streaked on the outer web with brown, the markings diminishing towards the outer feather; quills dark brown, the inner primaries and the secondaries finely tipped with white; 1st primary-shaft white; forehead, supercilium, orbits, face, throat, and all beneath, back, rump, and upper tail-coverts pure white, blending into the striped neck-sides; axillaries sparingly crossed with narrow brown bars, or almost pure white; under wing-coverts white, handsomely centred with brown; a series of dark spots through the lores, and another down the centre of the forehead.

In many examples the centre tail-feathers are devoid of the grey wash, being barred and marked like the rest, but more heavily; some have the under wing-coverts very openly marked with brown. The plumage of this species, as in *Tot. calidris*, is very smooth to the touch.

Summer plumage (Hankow, April). Wing 7·8 inches; tarsus 2·5; middle toe and claw 1·5. Head blackish brown; centre of frontal feathers the same, broadly margined with white; hind neck and wing-coverts dark brown; the scapulars, interscapulars, and tertials patched with deep black, some of the feathers almost entirely so; others pencilled with black round the edges; tail crossed with narrow wavy bars of black; face, fore neck, and chest streaked with blackish brown, continued upon the flanks; under wing-markings darker than in winter. From another specimen (April) it appears that the black coloration commences at the shaft, and spreads over the feather gradually.

An example from Norway has the markings of the fore neck, chest, and flanks very broad; consisting of central drop-shaped spots; the interscapular region is almost uniform black, and the ground-colour of the tertials very dark; the lower flanks are barred distantly with blackish brown. Wing of a female 7·2 inches; of a male 7·7 inches.

Nestling in down (Norway). Head and hind neck whitish, with a triangular patch of black on the crown; a small spot above the eye, a line through the lores, expanding into a broad streak over the ears black; the triangular coronal patch is streaked with whitish; back warm buff, with an irregular black streak down the centre, and other longitudinal irregular marks on the sides; a black band on the wing; beneath whitish, tinged with grey on the throat; tail blackish.

Immature (August, Pagham). Head darker than in the adult in winter; upper back and scapulars blackish brown, the feathers margined with fulvous; lesser wing-coverts blackish brown, the greater series edged with tawny grey; the tertials, which are dark brown, indented with the same; bars on the tail broad and blackish, and all the feathers white, but with a buff tinge; beneath white, the chest and flanks crossed with blackish-grey pencillings, and the sides of the throat boldly striated with blackish brown. The *plumage of the chest* is the most distinguishing characteristic.

Obs. This species differs slightly from the rest of the genus in the bill, which is slightly upturned from the centre to the tip, which is well pointed. It forms the type of the genus *Glottis* of Nilsson.

The dimensions of Indian examples are as follows:—♂, Sindh: length 13·0 inches; wing 7·5; tail 3·4; bill at front 2·05; tarsus 2·36 (*Hume*). ♀, Yarkand: length 13·35 inches; wing 7·65; tail 3·75; tarsus 2·35; bill from gape 2·45: weight 4·85 oz. (*Scully*). Mr. Cripps gives the measurements of females as:—length 14·5 to 15·0 inches; wing 7·33 to 7·5; tail 3·0 to 3·25; tarsus 2·33 to 2·5; bill from gape 2·3 to 2·52: weight 6·12 oz.

Distribution.—The Greenshank, one of the most widely-distributed species of this group, is for the most part a winter visitor to Ceylon, arriving in September and leaving in April; but numbers remain throughout the year, and are most likely birds which have not arrived at maturity and are not breeding. I have noticed them in quantity at Kanthelai tank in July and August, and likewise in the former month at many of the salt lagoons in the Hambantota and Yāla districts. In similar situations on the north-east coast I never saw them at this season; and as far as the Jaffna peninsula is concerned, I am unable to speak, not having been there during the S.W. monsoon. They are to be found on all the muddy tidal lagoons, estuaries, salt lakes, &c. on the north, north-west, and north-east coasts, as also down the eastern side of the island to Hambantota, and westward of that place towards Tangalla. It is common near Negombo; but I never met with it south of that place on the west coast nor in the Galle district, though I believe it is now and then found between Negombo and Matara in the extreme south. Though very common within the above-mentioned limits, it is not very numerous, as it is not found anywhere in large flocks, but only in small parties or even singly or in pairs. It is likewise partial to particular localities; for I have observed it to be less numerous at some salt lagoons than at other adjacent ones. I found it less abundant on the north-west coast than on the opposite side of the island; but Mr. Holdsworth remarks that it is very common at Aripu. In the interior I have only seen it at Kanthelai; but it doubtless finds its way to Minery and Padwiya tanks, and other large sheets of water, and it probably ascends the Mahawelliganga river into the Tamankadua Pattuwa.

This species is spread throughout the three continents of the Old World, extending from Eastern Asia through the Malay Archipelago to Australia and Tasmania; and also occurring in America, having been observed in Florida, and in South America as far south as Chile.

It is an abundant species in India. Jerdon remarks that it is to be seen in all parts of the country; and, as a matter of fact, we find that, in addition to being diffused all round the coasts in suitable localities, recent observations prove that it occurs in all districts in the interior which have been examined. It is common in the Deccan and throughout the region between the Godaveri and the Ganges. About Calcutta, Messrs. Blyth and Hume state that it is abundant; and in Furreedpore, "it is very common along rivers and creeks." It has been obtained at Umballa, and in parts of the north-west it musters in great force. Mr. Hume styles it extraordinarily abundant in the Punjab (50 being sometimes seen in a flock) and very common in Sindh: in the Guzerat district it remains until the end of May, and is sparingly distributed throughout it; it is likewise found in Kutch and Kattiawar, but in many localities is said to be "far from common." It was procured in Sikkim in spring by Capt. Bulger. Mr. Hume met with it on the island of Cardamum in the Laccadives, but elsewhere in that group found it absent. In Upper Pegu it is reported to be occasionally met with; but in the Irrawaddy Delta it is very abundant. In the Province of Tenasserim, Mr. Hume says it is common everywhere inland and on the coast; he does not record it from the Andamans, which is a noteworthy fact, considering that it is abundant on the mainland; but it has been procured in the Nicobars according to Herr von Pelzeln. I do not find any note of its occurrence in Sumatra; but in Java it has been obtained by Kuhl and Von Hasselt. It is probably found sparingly all round Borneo, as it has been recorded from the south of the island from Pontiniak and Tabanio. In Celebes it has been recently observed by Herr Meyer, who found it there in June and July; and previously it was procured there by Forster and S. Müller, which latter naturalist also obtained it in Timor. In New Guinea it will probably be found, although I find no data of its occurrence in the works of reference to which I have access; but in Australia it is distributed round the entire coast, and has been found in the Richmond and Clarence-river district (*Ramsay*). Gould remarks, as regards its general distribution in this region, that it is nowhere abundant, but that it is generally dispersed over the shores of the continent and Tasmania. Turning north again, we find that in the Philippines it has been obtained in Luzon, and, by Cuming, in another locality which has not been specified. In Hainan Swinhoe found it very abundant at the Hochow Marsh in March; and on the mainland of China it is generally distributed in winter. In Formosa the same writer met with it in April. As regards the Japanese islands it is said to be common in Yezo. It is found on the coast of the Sea of Okhotsk, and is common, according to Middendorff, in the breeding-season in the Stanowoi mountains, inhabiting the morasses on their slopes. It probably breeds in other parts of Northern Siberia, but it has been overlooked by recent travellers in that region. In Turkestan it was procured by Dr. Scully in October at Kashgar, and in August on the Karakash river. The Yarkandis say that it is found there near "running water or near pools and swamps; it disappears entirely in winter, but breeds in Eastern Turkestan in summer." Severtzoff notes that it occurs on passage in Northern and South-eastern Turkestan, and breeds on grassy steppes up to 4000 feet elevation. Prjevalsky observes that it is "an occasional visitor to the Hoangho, and a migrant through Gobi about the end of August. We did not," he says, "observe it anywhere else in Mongolia. It appears in limited numbers at Lake Hanka late in April; and single individuals are to be met with throughout the summer there, as well as on the Ussuri. In August it becomes again more abundant."

It winters in Palestine, and frequents the coast of Arabia likewise, for Wyatt observed it on the shores of the peninsula of Sinai. It is found in winter in Turkey, the Mediterranean islands, and Spain, in which latter country Mr. Saunders observed it until the end of May. It occurs in Southern Andalucia on passage from its winter quarters in Africa in March, April, and May. It is said to breed in Transylvania, in which province it is common during autumn. It also nests in Germany; but its proper summer quarters are the north of Scotland, the Hebrides, Denmark, Scandinavia, Finland, and Northern Russia. Messrs. Seebohm and Harvie Brown saw it on the Petchora at Ust Zylma on the 19th May, and afterwards found it abundant at Habariki. Turning now to Africa we find it inhabiting in winter the entire north coast from Tangier, where it chiefly occurs on passage in autumn and spring, to Egypt, throughout which country and Nubia it is, according to Captain Shelley, plentifully distributed, frequenting the banks of the Nile and the marshes of the Delta. Von Heuglin states that it is met with on the shores of the Red Sea as far south as the coast of Somauli, and along the Nile and its tributaries from August until April. He met with it once in the highlands of Abyssinia, and remarks that it is common in East Kordofan. Down the east coast it has been met with at Zanzibar and

at Mozambique; and it strays eastward still to the Seychelles, in which it has been noticed by Mr. E. Newton on Mahé and Curieuse islands. In South Africa it winters, and has been obtained in Natal and on the Limpopo river, where Mr. E. Buckley writes, in the 'Ibis,' that it is common. Layard remarks that in Cape colony it is common, and found on almost all the vleys throughout the country.

In Damara Land it is plentiful; and up the west coast of the continent it has been obtained in Benguela, Gaboon, and Prince's Island, also on the Gold Coast and in Senegambia. In Madeira it has occurred, according to Von Heuglin; and it is a straggler to some parts of the coast of North America.

Habits.—This very fine Sandpiper frequents the same situations as the rest of its group, being found on the borders of tidal rivers, salt creeks, lakes, and lagoons, on sand banks (about which its long legs enable it to walk before they are left bare by the tide), and also on the open beach. It is also, to a certain extent, a fresh-water species, frequenting the borders of tanks, jheels, and marshes; but about such localities it is found chiefly on passage and while breeding. I have always in the winter observed it, either singly, two or three together, or in little companies of not more than half a dozen, and it is frequently accompanied by a few other birds, such as its lesser companion, the Little Greenshank, and perhaps one or two Curlew and Lesser Stints. When wading in water, however, it is only the first-named bird, owing to the length of its legs, that is able to accompany it. While feeding, its manners are somewhat those of the Common Redshank; it walks hither and thither, pecking on one side and the other like that species; but it can always be recognized by its greater height, and, when it flies, by its peculiar note and the less amount of white displayed. It is tolerably wary, but will often allow itself to be walked up to within shot; when it rises it utters a loud note unlike that of other species of its group, and which consists of three syllables, the two loudest of which have been likened to *tung tung*. It feeds on small crabs to a considerable extent, which it finds on the muddy foreshores of tropical lagoons; but it also consumes aquatic insects, for which it searches in wet marshes and salt flats, near the edge of the tide, which are only covered just at high water. In little pools lying in such localities it may often be seen wading. The flesh of the Greenshank is very good eating, as there is an absence of any fishy taste about it, and it is not at all dry.

In the spring, prior to migration, it collects in large flocks of fifty or more, and shortly afterwards leaves for northern latitudes. In the Stanowoi mountains, Middendorff noticed it perching, "with much noise," on the tops of low trees growing round the morasses. In the Petchora valley, Mr. Seebohm found it frequenting marshy hollows and pools in the woods.

The flight of the Greenshank is very swift, and it has a habit of suddenly alighting, which is a somewhat difficult matter while flying with its accustomed speed; and to enable it to stop itself it half closes its wings and sways its body with a jerking motion from side to side, and then, throwing up its head, spreads out its wings in a position slightly inclined to the vertical, which at once brings it to a halt. I have on several occasions noticed this performance, and I find that other naturalists have observed the same thing. It is said to become very tame in confinement.

Nidification.—The Greenshank breeds in May and June; on the 12th of the former month Middendorff found it already at its breeding-haunts in North-eastern Siberia; and its eggs were taken by Messrs. Seebohm and Harvie Brown on the Petchora on the 11th of June. The nest is said to consist of a hollow scraped in the ground, lined with grass-stalks, feathers, leaves, and other dried vegetation.

The eggs of the Greenshank are four in number, and vary somewhat in size and shape, some being broad and pyriform, and others very long and pointed, without being much compressed at the small end. In colour they are mostly stone-buff or greyish buff, some having a slight olivaceous tinge. The markings vary from large blackish-sepia clouds, few in number, but distributed over the whole egg, to numerous rather smudgy blots and longitudinal dashes of lighter brown, mingled with bluish-grey blotches of several shades scattered over the whole surface. Small specks and short linear marks are mingled with these in some eggs, and large bluish dashes underlie at the obtuse end the first-named dark clouds of blackish brown, some of which run in a transverse direction. An egg of the broad type measures 1·87 by 1·35 inch, and of the elongated type 2·08 by 1·27. A smaller egg than either is 1·86 long by 1·24 broad. The specimens from which I take these descriptions are in the possession of Mr. Dresser, and were collected in Lapland and Finmark.

TOTANUS STAGNATILIS.

(THE LITTLE GREENSHANK.)

Totanus stagnatilis, Bechst. Orn. Taschenb. ii. p. 292 (1803); Gould, B. of Eur. iv. pl. 314 (1837); id. B. of Austr. vi. pl. 37 (1848); Blyth, Cat. B. Mus. A. S. B. p. 266 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Jerdon, B. of Ind. iii. p. 701 (1864); Layard, B. of S. Afr. p. 324 (1867); Swinhoe, P. Z. S. 1871, p. 407; Sharpe & Dresser, B. of Eur. pt. 1 (1871); Holdsw. P. Z. S. 1872, p. 475; Shelley, B. of Egypt, p. 257 (1872); Adam, Str. Feath. 1874, p. 338; Legge, Ibis, 1874, p. 29; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1159 (1874); Salvadori, Ucc. di Born. p. 328 (1874); Hume, Str. Feath. 1875, p. 183; Legge, Ibis, 1875, p. 402; Danford & Harvie Brown, *t. c.* p. 420; Butler & Hume, Str. Feath. 1876, p. 18; Armstrong, *t. c.* p. 348; Hume, ibid. 1878 (B. of Tenass.) p. 463; Davidson & Wender, ibid. 1878, vii. p. 89; Hume, ibid. 1879 (List B. of Ind.) p. 113.

Totanus tenuirostris, Horsf. Tr. Linn. Soc. xiii. p. 192 (1821).

Limosa horsfieldi, Sykes, P. Z. S. 1832, p. 196.

Totanus lathami, Gray & Hardw. Ill. Ind. Zool. pl. 51. fig. 3 (1833–4).

La petit Chevalier à pieds verts, Cuv.; *Barge grise*, Buffon, Pl. Enl. p. 876; *Marsh-Sandpiper* of some writers; *Snippet, Sandpiper*, Europeans in Ceylon. *Chota gotra*, Bengal. (Jerdon); *Kotan*, Tamils in Ceylon.

Adult male and female. Length 9·7 to 10·2 inches; wing 5·5 to 5·75; tail 2·3; tarsus 2·05 to 2·25; bare tibia 1·0 to 1·2; middle toe and claw 1·2 to 1·3; bill to gape 1·65 to 1·7.

Iris hazel-brown; bill dark brown, greenish at the base beneath; legs and feet bluish green.

Winter plumage (Ceylon). Very similar to the last in general character. Upper surface paler, especially on the head, hind neck, and greater wing-coverts; the head and hind neck with dark mesial lines, and the feathers of the back and wing-coverts wanting the dark indentations and inner edges; the tertials in some boldly marked with a streak parallel to the edge, or with zigzag bars departing from a dark mesial stripe; centre tail-feathers washed with pale ashy or reddish cinereous, and handsomely barred with irregular blackish markings, the terminal one being in general arrow-shaped and following the edge of the feather; face whiter than in the last, the frontal and loral stripes being wanting.

The markings of the tail are very variable, scarcely any two examples being alike.

Spring plumage (Africa). Wing 5·3 inches; tail 2·4; tarsus 2·0; middle toe 1·05; bill to gape 1·7.

The feet are said by Nordmann to be occasionally reddish black, slightly tinged with greenish on the articulations.

Feathers of the head, hind neck, and interscapular region with black centres and rufescent-grey margins, the ground-colour of the latter, together with that of the scapulars, isabelline-grey, with handsome black central blotches and shaft-stripes of the same hue; tertials and inner median coverts the same, crossed with angular marks of coal-black; wings slightly darker than in winter; tail much the same, but with broader bars; face, front and sides of neck with black linear marks; chest and centre of the breast unspotted white, but the sides of the breast with cross marks and central lines of black; under tail-coverts with a few black shaft-stripes.

This plumage is acquired, as a rule, early in the spring. Mr. Hume speaks of a specimen shot in February, on the Irrawaddy delta, in full summer plumage. Individuals in this dress vary considerably, the black markings being longer and more handsomely distributed in some birds than in others.

Immature (July). Head, upper back, and wing-coverts blackish brown, the feathers margined with fulvous, broadly

on the scapulars and wing-coverts; the tertials indented with the same at the margins; nape and hind neck greyish brown; centre tail-feathers barred with brown, the remainder pencilled round the edges, the tips tinged with rufescent; lores and supercilium white, with a dark stripe through the former; sides of the chest with cross "shadings" of brown.

Obs. This species is remarkable for the slenderness of its bill. It is very slightly turned up, or rather depressed in the centre, the tip being again curved downwards. In winter plumage it is more entitled to the name of Greenshank than the last-named, the legs of which are more blue than green. As regards size noted by other observers, Dr. Armstrong gives the following measurements:—"Length 10·2 to 10·7 inches; wing 5·2 to 5·3, expanse 15·5 to 16·2; tail 2·6 to 2·85; tarsus 2·0 to 2·03; bill from gape 1·7 to 1·75." I find that in series of European examples the wing varies from 5·1 to 5·4.

Other species of Asiatic Sandpipers are *Totanus incanus*, which has an easterly range from North-eastern Siberia down through the Malay Archipelago to Australia, extending likewise through Oceania to America; and a singular local Burmese form discovered by Dr. Armstrong, and named *Pseudototanus haughtoni*. This bird is said to be somewhat allied to the last species, but has a more massive, broader, and blunter-tipped bill, and also shorter legs than a typical *Totanus*; and Mr. Hume has therefore placed it in a new genus. I have not had the pleasure of seeing a specimen; but Dr. Armstrong gives the length of a pair as 12·9 (♀) to 13·2 (♂), wing 7·0 to 7·3, tarsus 1·65 to 1·85, bill 1·93 to 2·1 respectively. The plumage appears to resemble somewhat that of the Greenshank. I extract the following from this writer's description:—The upper surface is cinereous grey, the feathers with central stripes; lower back, rump, and upper tail-coverts white, with dusky terminal spots; the under surface, under wing, and axillaries pure white, the sides of the neck with narrow dark shaft-stripes; tail greyish white, margined and tipped with pure white, the central feathers brownish; primaries hair-brown; secondaries dusky brown, with white margins and tips.

Distribution.—The Little Greenshank, or "Marsh-Sandpiper," is the most abundant of its genus in Ceylon, arriving in numbers at the end of September and departing in May. Some, however, remain throughout the year, not a few birds having been seen by myself in the Hambantota district and at Kanthelai tank in July and August. It is found in the same localities as the last, viz. round the north coast down to Chilaw on the west, and all along the eastern side of the island to Hambantota on the south, frequenting salt lagoons, tidal flats, marshes near the sea, estuaries of rivers, salt-water creeks, and so forth. It is no doubt a frequenter of the Negombo Lake, and may be found as a straggler further down the west coast. Mr. Holdsworth remarks that it is very abundant at Aripu; and I noticed it there in creeks, and found it common at Manaar; but, on the whole, I did not remark that it was quite as numerous on the west coast as on the east. The great chain of salt lagoons between Mullaittivu and the Virgel, as also the Batticaloa Lake and the leways on the south-east, are frequented by numbers of this species. It ascends the Mahawelliganga for some distance, and is found, as I have remarked, as far inland as Kanthelai. It may possibly occur at Minery and at the Anaradhapura tanks.

Though possessing a very wide range, it is not spread over as much territory as the last species, not being found in America, and having in Europe neither a westerly nor a very northerly habitat; and, notwithstanding that it seems almost entirely to avoid Spain and Portugal, it is said to be common on the West-African coast.

It is common here and there throughout the Indian empire; but is not at all evenly distributed, being common in many localities, and curiously absent from intervening places. Jerdon says of it that it is less generally spread than perhaps any of the preceding species; he saw it in large flocks on the Trichoor lake in South Malabar, and he obtained it occasionally in various parts of the country. In the Deccan it is said to be common; and at Ahmednagar, in the Khandala district, the Rev. Dr. Fairbank obtained it. It is not recorded by Mr. Ball from any part of the district he examined; and from Mr. Cripps's Furreedpore list it is absent. It is found about Calcutta, but is not so numerous as the preceding species. In the north-west it is not very common; at Sambhur Mr. Adam only once met with it; and in Guzerat Captain Butler says it only occurs sparingly throughout the tank country, remaining till the end of May. Mr. Hume adds that it is not uncommon in suitable localities in Jodhpur, but that he had not received it or heard of it from Sindh, Cutch, or Kattiawar. It is evidently a bird which prefers a more southerly winter habitat along the meridian of its migration; and it therefore passes over India, pushing on to Ceylon, where it is stopped by the Indian Ocean, and consequently lodges in great numbers in that island.

In Pegu it occurs occasionally; but in the Irrawaddy delta it is more common, though "by no means abundant" (*Armstrong*). Southward in Tenasserim it is very rare, only having been procured once by Mr. Davison's collecting party near hot springs on the Attaran river. It is absent from the Andamans and Nicobars, and has not been procured in Sumatra. It is, however, recorded from Java, where it was obtained by Kuhl and Van Hasselt. In Borneo it was procured by Schwaner. It is a straggler to Australia; and it therefore must visit many of the intervening Malay islands on its way thither, its course of migration being most likely a direct one from Java and Borneo, through the Timor chain. It does not seem to go to the eastward at all, as I find no record of its occurrence in Celebes, the Moluccas, or Papua, and it furthermore does not occur in the Philippines. In Australia Mr. Ramsay records it from the Wide-Bay District; and Mr. Gould procured a solitary specimen on the banks of the Lower Mokai in New South Wales, in December 1839. Turning north again, we find that it occurs on passage on the coast of China; and Swinhoe obtained it in Hainan in February, and likewise in Formosa. It is not recorded from the Japanese islands, appearing to keep to the mainland in its northward passage. Middendorff and Schrenck both omit it from their works; and Prjevalsky did not meet with it in Mongolia or the Tangut region; and, finally, Messrs. Finsch and Seebohm did not observe it in Northern Siberia; Professor Nordmann, however, in Demidoff's 'Voyage,' intimates that it is found in Siberia. In Yarkand Dr. Stoliczka observed it during the first half of the winter, and records that it disappeared in December. Dr. Scully did not meet with it; but Severtzoff says that it breeds in Turkestan in the north and south-east, and is found up to an altitude of 4000 feet. In Palestine Canon Tristram observed it in winter; but it does not seem to be recorded from Asia Minor, and it is rare in Turkey. In the island of Corfu it was obtained by Lord Lilford. Its habitat in Europe is chiefly central; it occurs mostly in the south and in the Mediterranean islands on passage in spring, and breeds in Hungary and on the waste lands bordering the Danube, as also in Southern Russia. In Transylvania it is likewise common in spring and autumn; and the evidence as to its breeding there rests upon Herr Frivaldsky's obtaining it in the breeding-season; this naturalist has taken the eggs at Opay, in Hungary, and has seen the young near the Platten See. It is rare in France and Germany, as also in Holland, and is the only member of the group which has not occurred in England. It has been obtained once by Herr Gätke in Heligoland, an old male having been taken there on the 7th May, 1862; but it has not been observed as yet in Scandinavia. I find no record of its occurrence in Spain, with the exception of Mr. Saunders's statement that there is a single specimen in the museum at Barcelona. It is not uncommon, however, on the west coast of Africa; Capt. Shelley found it plentiful at Accra and at Cape-Coast Castle, and it has been obtained in Gambia and Ashantee. It is uncommon in South Africa: Layard procured it at Colesberg and George, and further remarks that Mr. Ayres obtained it in Natal.

Von Heuglin states that it is found in winter on the Blue and the White Nile, and especially in the marshes of East Kordofan; in March he observed it at the Tana Lake in Abyssinia, and in April and May in breeding-plumage on the spring torrents of East Senaar, and also at Alexandria at the beginning of August. It is natural, therefore, to infer that it may breed in Abyssinia. As regards Egypt, Captain Shelley writes as follows:—" The Marsh-Sandpiper ranges throughout Egypt and Nubia, but is not very plentiful on the Nile above Cairo, where we generally met with it singly or in company with the Wood-Sandpiper. In Lower Egypt and the Fayoom it is far more numerous, and in these districts I may have seen as many as a hundred in a day."

Habits.—This elegant Sandpiper is one of the most interesting of the genus *Totanus*, on account of the vivacity of its manners, the activity of its movements, and the tameness of its disposition. Besides frequenting tidal flats, sand banks, muddy foreshores, &c., it is very fond of resorting to little pools in wet salt marshes, which are filled daily by the tide, and shallow enough when the water has receded for it to wade about in. Here it is generally seen, in Ceylon, in company with the Long-toed Stint (*Tringa subminuta*); and as soon as it is met with it is sure to attract particular attention by its actions. Strutting quickly about, this way and that way, with its bill in and out of the water, snapping up the luckless larvae right and left, taking a quick little run to one side and then to the other, and seemingly quite unconscious of the doings of its little companions, who are likewise plying a busy trade in the shallower water all around it,—if there ever was a greedy hungry-looking bird, intent on gobbling up every thing that comes in its way in the shortest possible space of time, it is

the "Marsh-Sandpiper" at work on one of these little tidal pools. But fire into the busy troop, and, as is sometimes the case when birds are scattered, miss them clean! It is then that we discover the true nature of our Little Greenshank. Up he starts, screaming and piping with rage, and, after flying round and round the pond, still fussing and fuming at having been so rudely disturbed, he settles down quickly, and commences to hunt anew, screaming all the while as if it were impossible to exhaust his rage, until he espies the looked-for quarry and suddenly relapses into silence.

It is often to be seen consorting with its larger relative, as its long legs enable it to feed in just as deep water as that species, and occasionally it associates with the Wood-Sandpiper. As a rule, it is generally observed in little parties of two, three, or four, and is often found singly. At times I have seen it in little troops of more than a dozen, tightly packed together, and assembled evidently to "work" some particularly promising spot; they all advance in the same direction, with their heads down, rapidly scooping up the tiny crustaceans and larvæ on which they feed. Small univalves and other minute shells are to be found in its stomach, and I think aquatic insects form the least part of its food. It seldom, as far as I have been able to judge, frequents fresh water in Ceylon, though it may occasionally be seen in paddy-fields; but in India Jerdon found it in "young rice-fields and open marshy spots." Its flight is swift, and has the same darting gliding character as that of other Sandpipers. Mr. Thos. Robson, in writing to Messrs. Sharpe and Dresser, remark that they rest within the edges of marshes with muddy bottoms, on one leg; and when disturbed they hop out and rise from one leg.

Nidification.—As stated above, Severtzoff says that the Little Greenshank breeds in Turkestan in the northern and south-eastern districts of the country. We learn nothing, however, of its nest and eggs from his writings. It has, however, been found nesting in Hungary in June; and Mr. Dresser received its eggs from the Curator of the Pesth Museum. There are no details of the nest published by any author to whose works I have access; but it is to be inferred that the nest is similar to that of the last species. I find from an examination of a series that the eggs vary in ground-colour from dull clay-stone to olivaceous grey; they are moderately pyriform in shape, and are very handsomely and richly marked, some with very dark almost black straggling blotches, running into hieroglyphic-like dashes, over blots of paler brown and specks of bluish grey, and others with moderately-sized rather round blots of deep sepia, chiefly distributed over the large end, mingled with smaller specks and underlying washes of bluish grey. In one egg the large straggling clouds take an oblique direction, and impart a very handsome appearance to it. One egg in a series of five measures 1·64 by 1·06 inch, and another 1·49 by 1·07. These eggs, which were taken in Lapland, are in the collection of Mr. Dresser.

TOTANUS FUSCUS.

(THE DUSKY REDSHANK.)

Scolopax fusca, Linn. Syst. Nat. i. p. 243 (1766).

Totanus fuscus (Linn.), Bechst. Orn. Taschenb. ii. p. 286 (1803); Gould, B. of Eur. p. 309 (1837); Gray & Hardw. Ill. Ind. Zool. ii. pl. 53 (1833–34); Blyth, Cat. B. Mus. A. S. B. p. 266 (1849); Middendorff, Sibir. Reise, p. 214 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Jerdon, B. of Ind. iii. p. 702 (1864); Layard, B. of S. Afr. no. 615 (1867); Swinhoe, P. Z. S. 1871, p. 406; Holdsw. P. Z. S. 1872, p. 475; Shelley, B. of Egypt, p. 255 (1872); Gould, B. of Gt. Brit. pl. 55 (1873); Hume, Str. Feath. 1873, p. 248; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1167 (1874); Irby, B. of Gibraltar, p. 166 (1875); Dresser, B. of Eur. pt. 40 (1875); Butler & Hume, Str. Feath. 1876, p. 18; Cockburn, *t. c.* p. 509; Seebohm & Harvie Brown, Ibis, 1876, p. 292; Blakiston & Pryer, ibid. 1878, p. 220; Hume, Str. Feath. 1878 (B. of Tenass.), p. 463; Ball, ibid. 1878, vii. p. 228; Hume, ibid. 1879 (List of Ind. Birds), p. 113.

Dusky Snipe, *Cambridge Godwit*, and *Black-headed Snipe*; *Black Snipe*, Lath. Synopsis; *The Spotted Redshank* of some. *Butan*, Hind.; *Yerra kal ulanka*, Telugu (Jerdon).

Adult male and female (British Museum, England and North India). Wing 6·4 to 6·6 inches; tail 2·8; tarsus 2·2 to 2·3; middle toe 1·2; bill to gape 2·4 to 2·65; depth of web of outer and middle toe 0·24.

The dimensions of a large series of winter specimens from Sindh are given by Mr. Hume as follows:—Length 12·9 to 13·3 inches; wing 6·5 to 6·9, expanse 21·0 to 22·0; tail from vent 2·9 to 3·2; bill at front 2·3 to 2·4; tarsus 2·3 to 2·4. Weight 7·5 to 9·0 oz.

A pair in summer plumage, shot by Mr. Cockburn, of the Allahabad museum, are recorded as measuring:—♂, length 13·0 inches, wing 6·25, tail 2·12, bill (at front?) 2·12; ♀, length 14·0 inches, wing 6·38, tarsus 2·25, middle toe 1·58, bill (at front?) 2·25.

Iris brown; bill black, base of under mandible and basal margins of the upper orange-red; legs and feet orange-red. Specimens shot in summer plumage (May) by Mr. Cockburn had *dark green* legs.

Male, summer plumage (Nepal, British Museum). Head, face, throat, fore neck, chest, and breast dull black; above the lores the feathers are streaked with white passing over the eye; face and sides and back of neck also streaked with white, the chin and fore neck less so; the flanks and the sides of the breast barred with white, and the breast-feathers tipped with the same; interscapular region, scapulars, and wing-coverts dark ashy brown, crossed with wavy softened bars of blackish, the lighter portions of the feathers changing to white at the margins, which is most conspicuous on the wing-coverts, which are also tipped with white; tertials similar to the scapulars; primaries and their coverts brown, the first shaft white, the remainder brownish; secondaries brownish, barred and tipped with white; back and upper tail-coverts white, the latter barred with blackish brown; tail *ashy grey*, barred with brown, the lighter portions white on the inner webs; sides of the rump like the upper tail-coverts; lower tail-coverts white, barred with blackish; axillaries pure white.

An example in change (*spring plumage*) is much the same as the above on the back; but the fore neck and under-surface feathers are in process of change to the black plumage, the dark portions of the feathers being chiefly in the form of bars; many of them have the entire terminal portion black, and some the centres, scarcely any two feathers being coloured alike.

Female. Differs in the less uniform hue of the under surface, and in having the chin white. An *August* example in full plumage (Obdorsk, Siberia) is white beneath, closely barred with blackish brown; fore neck and chest

blackish grey, much streaked with white; chin and throat white; head and loral stripes blackish brown, the former slightly streaked with white; back and scapulars not so dark as in the above.

Winter plumage (England). Above brown, unspotted on the head and hind neck; a whitish stripe above the lores and one behind the eye; upper back and scapulars dark brown, with marginal white spots; wing-coverts with interrupted white bars and terminal lateral spots of the same; secondaries brown, barred with white, as are also the outer webs of the inner primaries; tertials indented with white; back white; rump, upper tail-coverts, and tail brown, narrowly barred with white—exactly the converse of the coloration in the Common Redshank: chin and gorge white, unmarked; the rest of the under surface white, with dark streaks on the fore neck and sides of the chest; legs dull red.

The change to the dark summer dress takes place by a gradual alteration in the colour of the lower parts, which first become barred with blackish brown, while the ground-colour of the upper surface darkens, the feathers at the same time assuming the black coloration.

Young in down. "Covered with down close at the base, but with the tips radiating out like hairs; upper parts variegated blackish brown and brownish buff; forehead buff, with one central dark stripe, which joins the blackish brown on the hind crown; a narrow blackish stripe passes also from the base of the bill through the eye to the hind neck; underparts dusky white, clouded with brownish buff on the breast and flanks." (*Dresser.*)

Immature birds nearly resemble the adult in winter plumage, but have the under surface barred with sooty grey, and the chest striped with the same; wing-coverts, scapulars, and interscapulars tipped with whitish.

Distribution.—Layard includes this Redshank among the Waders he procured in the north of Ceylon; and I infer that it is a *straggler* to the island, probably occurring chiefly in the Jaffna peninsula. I have never met with it myself nor seen it in any collections made in Ceylon subsequently to Layard's time; and hence my reason for believing that it must be a rare bird in Ceylon, particularly as it is a species which has not a southerly range. Jerdon states that it is found throughout India in the cold season, either solitary or in moderate parties. From recent observations it would appear to be found chiefly in the north—Bengal and the north-western districts of the empire. It is not recorded from the Deccan; but the maritime districts of the south of the peninsula must be included in Jerdon's habitat, for he collected much in the south. Mr. Ball includes it in his list of birds from Chota Nagpur and the Godaveri, but cites only the Rajmehal hills and Birbhum as localities; from Raipur and Sambalpur it is noted by Mr. Hume, who likewise says that it is moderately common about Calcutta. It is not included by Captain Beavan nor Mr. Cripps in their lists. In the Punjab and in Sindh it is said to be very numerous in the cool season; and in the Mount-Aboo district, where it is found until late in May, it is "not uncommon" (*Butler*). It is found in Kutch and in Kattiawar too, and it is not common at the Sambhur Lake. At Allahabad Mr. Cockburn met with a large flock on the 8th of May in full breeding-plumage; and in the British Museum there are specimens in summer plumage collected by Mr. Hodgson in Nepal. I find no mention of it in Pegu or from the Irrawaddy delta; and in Tenasserim it has only been found at the mouth of the Sittang river. Its range does not extend to the Malay peninsula or the archipelago, nor has it, as yet, been found in the Philippines. It was procured in Formosa by Mr. Swinhoe; and in China he records it from Canton, Tientsin, and Shanghai. Prjevalsky met with it in South-east Mongolia during spring migration. It is said to be common in Japan in Yezo; and I presume it is found there either late in the spring on passage or in summer. In Eastern Siberia Middendorff met with it, and writes that it breeds not unfrequently on the Boganida river, beyond which it extends into Kamtchatka, and thence into the Aleutian Islands. It has not been met with in Kasgharia; but Severtzoff says that it occurs on passage in the north-western portion of Turkestan, and that it breeds there on grassy steppes and in cultivated districts up to 4000 feet. Mr. Seebohm does not appear to have met with it on the Yenesay; but on the great sister stream, the Ob, Dr. Finsch found it as far north as Obdorsk, which is at the mouth of that river and on the gulf of the same name.

In Europe it is a winter visitor to the southern portions of the continent, and is not uncommon in Spain, to the southern portion of which, Mr. Howard Saunders says, it is a regular migrant. The same may be said of Italy and Greece. In Sardinia it occurs in March on passage; and in Malta it is a regular migrant. In Transylvania it is not uncommon during migration; and it has been shot in June in that province. In Southern Germany, and also in Bohemia, it is commonly met with in autumn.

It breeds in Finmark and Northern Russia eastward to the Petchora, and also in Norway. On the last-named river Mr. Seebohm found it in small troops in June at Habariki, where it appeared to be breeding, but its nest was not found. Further north than this Von Heuglin considers he saw it on Waigats Island, between the north coast of Europe and Nova Zemla. In Southern Russia it only occurs on passage.

Going south again to trace out its African range, we find Col. Irby stating that it occurs on passage in spring and autumn at the Straits of Gibraltar, on the Tangier side of which Favier notes that it frequents salt marshes and lagoons in September and October. It was observed in Algeria by Loche; and in Egypt it is sparingly distributed, according to Captain Shelley, who met with it only at Sakkara in Central Egypt on the 7th of April. Von Heuglin identifies a flock of eight birds which he met with at Ras Belul on the Red Sea in September as belonging to this species, but he was unable to procure a specimen. Layard procured one specimen at Knysna in Cape colony.

Habits.—In India the Dusky Redshank frequents the borders of rivers and lakes on the sea-coast, and is also found about flooded marshes and in the vicinity of jheels. In the Point-Pedro district Layard probably met with it on the back-waters and on the muddy foreshores of the salt lagoons which intersect the Jaffna peninsula, and which constitute a paradise for all the Waders which visit the north coast of Ceylon.

Like its smaller congener last noticed it is generally shy and wary. It congregates more in flocks than the Common Redshank, although it may often be met with singly. In Sardinia Mr. A. B. Brooke noticed that they were "wild and independent, never seeming to care much for the company of other Sandpipers, but when disturbed separating at once, and generally flying a long distance before alighting." When in small flocks, feeding, it keeps in close company and walks quickly, picking up its food as it proceeds. Its diet consists of worms, aquatic insects, minute crustaceans, and the spawn of fish and frogs. It is said to be able to swim well and to dive on the approach of danger from a bird of prey or when being pursued after being wounded. Its note is a shrill whistle, which some writers liken to the syllables *tshweet, tshweet.* Naumann says that it utters a low note of welcome, like *tick, tick, tack,* when one joins its companions; and in the breeding-season it has a cry which Mr. Wolley likens to *tjeuty.* Mr. Dresser remarks that it frequents inland situations much more than the Common Redshank, affecting morasses where there are little open sheets of water.

Nidification.—The Dusky Redshank, as far as Europe is concerned, breeds in Finland, Mr. Wolley having been the first to discover its eggs and breeding-haunts. In Asia it doubtless nests in Northern Siberia, not far short of the latitude of the Arctic circle. From Mr. Wolley's interesting letters addressed to Mr. Hewitson I subjoin the following extract, taken from Mr. Dresser's 'Birds of Europe.' After referring to its cry, which, he says, has a local meaning, signifying *burnt wood,* Mr. Wolley remarks :—"Certain it is that this black bird not unfrequently lays its eggs in a part of the forest which has formerly been burnt; and here is one of its most unexpected singularities—a marsh-bird choosing the driest possible situation, even hills of considerable height. I have myself seen two nests so placed; and one of them at least was on ground which, from charred wood lying about, had evidently been burnt at some former period. They were nearly at the top of long hills, many hundred yards from marshy places, with good-sized firs on all sides . . . . . . The bird sits sometimes so close that one is tempted to try and catch it in the hand, its white back conspicuous as it crouches with its neck drawn in. It either gets up direct or runs a short way before it rises; and then it flies round with an occasional *tjeuty,* or stands upon the top of a neighbouring tree, showing the full length of its slender legs, neck, and bill. But it is not till it has young that all its powers of eloquence are fully brought into play: it then comes far to meet any intruder, floating over him with a clear cry that echoes through the forest, or that is heard over a great extent of marsh, or it stands very near one, bowing its head, opening its beak quite wide in the energy of its gesticulations." Mr. Meeves, in writing to Mr. Dresser, says that "the nest is merely a depression in a tussock which is overgrown with moss, lichens, and blueberry-plants; the inside of the nest is lined with leaves." The eggs are four in number, and are

of the usual pyriform shape, although they are not much compressed at the small end, and vary in colour from a fine olive-green to a brownish-olive hue. Those of the former type are marked with large rather even-edged blotches of sepia, mostly gathered round the large end, though not in the form of a zone; beneath them are the usual primary markings of clear bluish grey. Eggs of the browner types are similar in character, but the secondary or underlying markings are browner; all have small blots or specks mixed with the larger, which run generally in a longitudinal direction. In a fine series before me, collected by Mr. Dresser in Northern Europe, some measure 1·86 by 1·25 inch, others 1·85 by 1·23 and 1·82 by 1·23, which shows that there is little variation in their size.

TOTANUS CALIDRIS.
(THE COMMON REDSHANK.)

Scolopax calidris, Linn. Syst. Nat. i. p. 245 (1766).
Tringa gambetta, Gm. ed. Syst. Nat. i. p. 671 (1788).
Totanus calidris (Linn.), Bechst. Orn. Taschenb. ii. p. 284 (1803); Gould, B. of Eur. iv. pl. 310 (1837); Blyth, Cat. B. Mus. A. S. B. p. 266 (1849); Middendorff, Sibir. Reise, p. 215 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Irby, Ibis, 1861, p. 239; Schlegel, Mus. P.-B. *Scolopaces*, p. 65 (1864); Jerdon, B. of Ind. iii. p. 702 (1864); Legge, Ibis, 1866, p. 420; Layard, B. South Afr. no. 611 (1867); Blanford, Zool. Abyss. p. 483 (1870); Swinhoe, P. Z. S. 1871, p. 406; Holdsw. P. Z. S. 1872, p. 474; Gould, B. Gt. Brit. iv. pl. 54 (1873); Shelley, B. of Egypt, p. 255 (1872); Hume, Str. Feath. 1873, p. 248, et 1874, p. 279; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1165 (1874); Salvadori, Uccelli di Born. p. 328 (1874); Irby, B. of Gibraltar, p. 166 (1875); Walden, Trans. Zool. Soc. ix. p. 234 (1875); Legge, Ibis, 1875, p. 402; Dresser, B. of Europe, pt. 39 (1875); Blanford, Zool. Persia, p. 285 (1876); Butler & Hume, Str. Feath. 1876, p. 18; Scully, *t. c.* p. 189; Armstrong, *t. c.* p. 348; Davidson & Oustalet, Ois. de la Chine, p. 464 (1877); Hume, Str. Feath. 1878 (B. of Tenass.), p 464; Cripps, ibid. 1878, vii. p. 304; Hume, ibid. 1879 (List of Ind. B.), p. 113.
Gambetta calidris (Linn.), Bonap. Compt. Rend. xliii. p. 597 (1856).
Le Chevalier aux pieds rouges, Buffon; *Gambetta, Chevalier rayé*, Buffon; *Gambet Sandpiper, Striated Sandpiper*, Latham; *Tureluur*, Dutch; *Chalrêta*, Portuguese; *Nastojaschy-ulit*, Russian. *Chotabatan*, Hind. (Jerdon); *Mallee kotan*, Tamil.
Maha watuwa, Sinhalese.

Adult male and female (Ceylon). Length 11·0 to 11·5 inches; wing 6·0 to 6·45; tail 2·6 to 2·7; tarsus 1·9 to 2·05; bare tibia 0·8 to 1·0; middle toe and claw 1·3 to 1·35; bill to gape 1·85 to 2·02; expanse 1·95 to 2·0. "Weight 6 oz." (*Hume*).

Iris reddish or yellowish brown; bill black; upper mandible with the base as far as the nostril reddish, and nearly half the under mandible red (the amount of red variable); legs and feet orange-red, joints in some greyish.

Winter plumage. Head, hind neck, interscupular region, tertials, and wing-coverts glossy cinereous brown, the tertials with pale edges and dark indentations; lores brown, darkening just in front of the eye; above them a white streak, more or less lengthened into a supercilium; primaries and their coverts blackish brown; secondaries and their coverts paler brown at the base; the terminal third of the former and the tips of the latter, together with the inner webs and terminal portion of the shorter primaries, white; the coverts likewise have their outer edges indented with white, and a bar of the same next the tip; 1st primary-shaft white; centre tail-feathers brownish cinereous, indented with darker brown, remainder with the coverts white, barred with brown; chin, throat, breast, lower parts, back, and rump white; the under tail-coverts with dark mesial lines; lower part of face and sides of throat striated with brown; axillaries pure white; chest whitish, with the centres of the feathers brown, with darker mesial lines, which are generally continued down on the breast.

Summer plumage (Norway, June: British Museum). Wing 6·3 inches; tail 2·8; tarsus 1·8; middle toe 1·25; bill to gape 1·8.

Forehead, lores, and face blackish brown, striated with white; the throat and fore neck with more white, the edgings of the feathers being broader and gradually increasing on the chest and lower parts, which may be said to be white, boldly streaked with black everywhere, except on the abdomen; crown and hind neck blackish brown, the feathers on the former edged with rusty, the latter with greyish margins to the feathers; lower part of hind neck,

interscapulars, and scapulars glossy olive-brown, streaked and patched with blackish, taking the form of bars on the scapulars; many of the feathers with fulvous marginal spots; greater wing-coverts barred with white near the tips; upper tail-coverts and tail more barred than in winter.

An example from Northern Asia is darker than the above; the back and scapulars are greenish black, and the fulvous markings quite obscured. Wing 6·3 inches; tarsus 1·9; bill to gape 1·85. Specimens arrive in the Andamans in September in summer plumage.

Young chick (Orkneys). Bill to gape 0·7 inch; tarsus 1·0.

Head and wings rufous, streaked with black; down the forehead and through the lores a black streak; back buff, handsomely marked down the centre with black; sides mottled with the same; face and fore neck buff; chin and breast whitish.

In first plumage (June, Yarkand). "Bill black at the tip, dusky grey at base; irides very dark brown; legs and feet dull orange-fleshy." *Older bird.* "Bill black at tip, greenish slaty at the base; legs and feet greenish yellow, claws black" (*Scully*). Wing 5·9 inches in this stage.

On arriving in Ceylon birds of the year have the legs and feet yellowish red.

The brown portions of the upper plumage have the feathers dark-shafted and the edges *fulvous* white, with subterminal margins and interrupted bars of blackish brown; the wing-coverts are conspicuously marked in this manner, and the tertials have deep white indentations or interrupted bars; upper tail-coverts more closely barred than in the adult; the sides of the throat, fore neck, and chest with dark mesial stripes on a white ground, and the whole of the under surface and under tail-coverts with narrow drop-shaped marks of the same.

When a little older, as seen during the winter in Ceylon, the wing-coverts have conspicuous *whitish* edgings and dark indentations, and the dark mesial lines on the fore neck are plainer than in old birds. The amount of white on the wing-coverts varies much at this time; but the head, hind neck, and interscapular region are always uniform brown.

Obs. This species has the webs more developed than its congeners; that between the middle and inner toe is quite as deep as the outer web in the Marsh-Sandpiper (*T. stagnatilis*). It has been placed in a separate genus (*Gambetta*), and might well stand in it; but I prefer to keep it in *Totanus*. My measurements of Ceylon specimens do not quite equal those of individuals from other parts. Dr. Scully records *males* as—length 11·0 to 12·0 inches, wing 6·45 to 6·55; *females*—length 11·75 to 11·9 inches, wing 6·35 to 6·5. Dr. Armstrong finds that females are smaller—wing 5·8 to 6·1 inches, against 6·8 (?5·8) to 6·3 inches. This inferiority in size, however, is not constant; a male in my collection measures 6·1 inches, a female 6·4; and, in fact, I have usually found females the larger of the sexes.

Distribution.—The Redshank is an abundant cool-season migrant to Ceylon, and is more numerous, so far as I ascertained, on the east and north-east coasts than on the north-west. I met with it all over the Jaffna Peninsula, and at suitable places down the coast to Manaar. It was in goodly numbers at Illipekadua and in the Erinativoc Islands; and on the great flats just to the north of the island of Manaar I also saw it. It is found at Puttalam; but south of Chilaw it occurs, according to my experience, rarely and in few places. The only spots I have personally met with it were the islands at the foot of the Negombo Lake and the Pantura lagoon. In the Trincomalie district, and thence north to Mullaittivu it is very common, and as numerous on the borders of the great salt lake of Nilāvele as anywhere in the island. It is found at the mouths of the rivers all down the east coast, and also about the leways or salt lagoons in the Yāla and Hambantota districts. I never met with it between Tangalla and Galle, nor to the north of the latter place; and I have not seen it away from salt or brackish water, it being almost entirely a littoral species. It does not quit the island until May, and arrives in September.

Jerdon states that it is found throughout the greater part of India in the cold season. It, however, appears to be rare inland. In the Deccan, for instance, we find it recorded as rare (*Davidson*); and the Rev. Dr. Fairbank does not mention it at all. Nor is it noticed as inhabiting the district lying between the Ganges and Godaveri, or Chota Nagpur proper, although it must inhabit the estuaries of rivers flowing through that region. It is very common on the Hooghly and about Calcutta, being the most abundant species of its genus in the market there. In Furreedpore it is not common. In the north-west it is abundant, being freely diffused in suitable localities throughout Kattiawar, Guzerat, Kutch, and Jodhpoor, but more partial to the

shore and the sides of large rivers than to inland waters. At the Sambhur Lake it is rare, but is recorded as returning as early as the 25th July. It remains in the Guzerat district until May, according to Capt. Butler. Eastward of the Bay it is abundant: it occurs in large quantities, writes Dr. Armstrong, between Elephant Point and China Bakeer, and along the margins of the nullahs and creeks in the vicinity. In Tenasserim it is "common throughout the province during the cool season, alike on the coast and in and on every little pool." In the Nicobars it has not been noticed; but in the Andamans it is found along the salt-water creeks, is quite common from September till May, and has been killed in June in winter plumage (*Hume*). It has been recorded from Singapore, and in Java it was obtained by Herr Kuhl and Van Hasselt. In Borneo it has been obtained in the south at Pagattan, Pontianak, and Sarawak. Forsten procured it in Celebes; and Lord Tweeddale includes it in his list of the birds of that island; but Dr. Meyer, during his recent explorations in that island, does not seem to have met with it. According to Swinhoe it winters in China, being generally distributed there; but I find no mention of its occurrence in Formosa, although he got it in Hainan. Père David speaks of it as common in the two seasons of passage. In the Philippines it has been obtained by Cuming. It does not appear to have been noticed in Japan; but on the south coast of the Sea of Okhotsk and in the Shantar Island Von Middendorff shot it in August. Schrenck did not meet with it in Amurland, nor in the territory of Iakoutsk; nor does Mr. Seebohm record it from the Yenesay. It is therefore evident that in Asia, as in Europe, it has not a high northerly summer range, being content to breed in lower latitudes than many of its relatives. Prjevalsky writes of it as follows:—"Breeds sparingly in the Hoang-ho valley and about the shores of small rivers in South-east Mongolia, whither it migrates in the end of March, about which time it was also numerous at Koko-nor, and in August, during migration, about the rain-puddles in Gobi. We did not find it in the Ussuri country." In Yarkand Stoliczka noticed it during the first half of the winter, and Scully obtained it as early as March in the same locality; he writes as follows:—"The first specimen of the Redshank was obtained at Kashgar in November, where it was tolerably common; and after that it was not met with until March; and in May and June this species swarmed everywhere near water in the vicinity of Yarkand. The bird was also found in the valley of the Karakash towards the end of August." In Turkestan it occurs on passage, according to Severtzoff, and breeds rarely in grassy steppes and in cultivated districts up to an altitude of 4000 feet. As regards Persia, Mr. Blanford writes:—"The Redshank probably breeds in the Persian highlands at the Lake of Shiraz and other places. De Filippi met with it in July near Sultániah." In Baluchistan it was occasionally seen by him. Canon Tristram met with it in Palestine in the winter only; and in Asia Minor it is spoken of as being common on marshy ground, and observed until the 13th of May (*Danford*).

In Europe it is very abundant, and breeds in some countries, notably in Spain. Here Mr. Saunders found it common in the summer and nesting in marshes. Col. Irby states:—"I found the common Redshank in some numbers at the lakes of Ras Dowra towards the end of April; and they were then evidently beginning to nest. They were not in any thing like the quantity which breed in some parts of the marismas of the Guadalquivir. . . . In Andalucia this Redshank is, though frequently seen in winter, chiefly migratory, passing north in great abundance mostly towards the middle of April." In France, Germany, Holland, and England it is resident. In the Low countries Mr. Labouchere says it is the most common Wader after the Lapwing. In many parts of England, but chiefly on the east coast, it is found in considerable numbers, but does not breed so plentifully now as in former days. In North Frisia Mr. Durnford found it breeding in numbers; and Naumann states that it is common on the shores of the Baltic. It migrates as far north as Finland, arriving there in May; but it does not appear to reach more easterly districts, if we are to judge by its absence from the Petchora, such a notable breeding-place of Waders. In a westerly direction, however, its range extends to Iceland, where it is even resident.

It winters in Morocco, leaving for the north in March and April, and returning in September, according to Favier. It is common in certain localities on the west coast (Senegambia, Ashantee, &c.); and Captain Shelley met with it in numbers at the mouths of rivers on the Gold Coast. It wanders as far south as the Cape, but is not so numerous in South Africa as others of the group. Layard remarks that it is found sparingly about the Knysna estuary and the mouth of the Salt River, near Cape Town; at a place called Zoetendals vley it was abundant in November. He also records it as having been shot by collectors at Lake Ngami.

On the eastern side Von Heuglin met with it frequently in Eastern Kordofan, on mountain-streams in Abyssinia, and on the Blue and White Nile, from September until March; and in the summer he found it in pairs on the Red Sea and in Nubia and Egypt. In the latter country he says that it is very abundant in the Nile delta, but rare above Cairo. It has been noticed in Algeria, but not by Mr. Gurney.

Habits.—This noisy and watchful Sandpiper is found in Ceylon on the muddy banks of river-estuaries, the edges of salt lagoons lined with trees and mangroves, which afford it shelter, on the foreshores of salt lakes, and particularly on salt-water creeks which run through alluvial land and unite with rivers near their mouths. It is of all the Waders which frequent the island the most wary on the watch, ready to fly away, and rises at the slightest appearance of danger. When alarmed, or when disturbed by hearing the approach of man, it utters its loud call, keeps still, and watches intently till it becomes aware of his proximity, when it is off in an instant, glancing along and beneath the bank, or close by the row of trees which covered it from view, with an arrow-like flight, swerving adroitly in its progress if it happens to pass near any one without having previously seen him; and when shot at and missed it generally swoops down in its flight and rises instantly again, darting round curves and corners with marvellous speed. It utters its note on the wing as well as at rest; and when a small flock are disturbed by being fired at they all give vent to their excitement in these loud calls, settling down only for an instant, rising again, darting back, and passing and repassing the place from which they have been driven until the intruder is out of reach. They wade up to the body while feeding, and walk hither and thither, picking up a morsel first on one side and then on the other, and holding themselves with much grace and elegance. It does not associate with other Waders, and is not sociable towards its own kind; it generally feeds singly; and if a small troop are found in the same locality, not more than two are usually together, the rest of the company being scattered along the bank at intervals of 10 to 40 yards. These little troops consist of from two to six or seven birds; and when they are disturbed they very often separate, and each one flies its own way. This Redshank may be always recognized on the wing by the large amount of white it shows on the back and wings, as well as by its loud note. Capt. Shelley says that this can be easily imitated, and by so doing the birds are called round within shot.

I have found its diet to consist of small shells, shell-fish, and aquatic insects. Mr. Dresser has noticed it picking up food on the beach when the surf was breaking on it, and avoiding the waves with apparent ease by running with great swiftness. Its favourite situation in Ceylon among those above mentioned is the tidal expanse to a salt lagoon, where the banks are high enough to conceal it, and above this a tolerable amount of mud left bare by the receding tide. In similar localities I always met with it in Essex, where the network of creeks threading the low land on the coast used to be frequented by scores of these birds. Mr. Cripps mentions the fact of one "hovering" over a small Cormorant (*Phalacrocorax pygmæus*), which it was trying to annoy, which circumstance reveals a singular trait in its disposition. Col. Irby speaks of seeing a flock of thirty or forty, each one a little in the rear of the other, forming a sort of oblique line, and advancing across a shallow jheel, all with their heads immersed in the water, and moving them from right to left with great rapidity. An abundance of food had here caused these birds to unite in a flock, contrary to their habit.

Nidification.—The majority of Indian and Ceylonese winter birds probably breed in Turkestan and Kashgaria, though many may go further north. Von Heuglin gives 71° as the limit of their Arctic journey; but they evidently do not nest far north in such numbers as other Sandpipers. It is an early breeder both in Asia and Europe. Dr. Scully says of it in Yarkand:—"This species breeds from April to June. On the 22nd April three of its eggs were obtained, which seem very large for the bird; they measure 1·8 by 1·23, 1·78 by 1·22, and 1·76 by 1·21 inch. In shape they are moderately broad ovals, a good deal compressed and lengthened out at one end. They have a very faint gloss. The ground-colour is grey stone, with spots, a few streaks, and numerous blotches of blackish brown and sepia scattered pretty evenly over the whole surface of the egg, except at the point, where the spots occur only sparingly."

In 1865–66 I had ample opportunity of observing the nidification of this species on the marshes on the coast of Essex. I found them breeding as early as the first week in April and until the middle of May in pasture-land covered with coarse rye-grass in company with the Common Pewit. The nests were one and all placed in the middle of tufts of grass, some of which were so small that it was difficult to comprehend how

the birds could conceal themselves in the middle of them. The centre of the tuft was beaten down, and a little cavity thus made with no other lining than the green standing grass on which the eggs, two, three, and four, were deposited, and not placed with the small ends together, owing probably to the birds disturbing the position of the eggs on leaving them without being able to readjust them. The end of the blades of grass thus trampled down were arranged round the sides of the space thus formed, and constituted the walls of the nest. There were no entrances to these nests, or, rather, "forms," although there were little tracks in the surrounding grass, showing where the bird approached and left her eggs; but they ceased at the edge of the tuft, and the ways of egress and ingress were carefully closed up. Nothing could be more admirably concealed than these eggs, for above them the tops of the grass-blades were brought together, so that they were entirely hidden from view. They varied but little in colour and marking, being all of a rich ochre ground-colour, beautifully blotched and spotted with rich reddish brown.

When disturbed the Redshanks flew right away from the ground and settled in the surrounding creeks; but the Pewits flew round and round their nesting-ground in their accustomed manner.

A further series which I have examined, in the collection of Mr. Dresser, and taken in Northern Europe, are stone-yellow and olivaceous yellow in ground-colour, marked in some cases with large blotches of dark sepia intermixed with smaller spots overlying specks of bluish grey. Others are without the larger markings at the obtuse end, and are more thickly covered with small blots. Some measure 1·78 by 1·13 inch, others 1·77 by 1·23 and 1·65 by 1·14. They are moderately compressed at the small end and rounded at the large.

TOTANUS GLAREOLA.

(THE WOOD-SANDPIPER.)

Tringa glareola, Linn. Syst. Nat. i. p. 250 (1766).

Totanus glareola (L.), Temm. Man. p. 421 (1815); Gould, B. of Europe, pl. 315 (1837); Middendorff, Sibir. Reise, ii. p. 215 (1853); Schrenck, Reisen u. Forsch. Amur-L. i. p. 416 (1860); Schl. Mus. P.-B. *Scolopaces*, p. 71 (1864); Layard, B. of S. Afr. no. 614 (1867); Swinhoe, P. Z. S. 1871, p. 406; Shelley, B. of Egypt, p. 259 (1872); Gould, B. of Gt. Brit. iv. pl. 57 (1873); Salvadori, Uccelli di Born. p. 327 (1874); Hancock, B. of North. p. 121 (1874); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1163 (1874); Hume, Str. Feath. 1874, p. 298; Irby, B. of Gibraltar, p. 167 (1875); Legge, Ibis, 1875, p. 276; Seebohm & Harvie Brown, Ibis, 1876, p. 291; Dresser, B. of Europe, pt. 57, 58 (1877); Blakiston & Pryer, Ibis, 1878, p. 220; Seebohm, Ibis, 1879, p. 152.

Totanus affinis, Horsf. Trans. Linn. Soc. xiii. p. 191 (1821); Gray & Hardw. Ill. Ind. Zool. pl. 51. fig. 2; Sclater, P. Z. S. 1873, p. 222.

Rhyacophilus glareola (Linn.), Kaup, Nat. Syst. p. 140 (1829); Walden, Trans. Zool. Soc. 1875, ix. p. 233; Hume, Str. Feath. 1878 (B. of Tenass.), p. 462, 1878, vii. p. 488, et 1879, pp. 70, 113 (List Ind. B.).

Tringa littorea, Pall. Zoogr. Rosso-As. p. 195 (1810).

Actitis glareola (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 267 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Jerdon, B. of Ind. iii. p. 697 (1864); Holdsw. P. Z. S. 1872, p. 474; Legge, J. A. S. (Ceylon Branch), 1873, p. 53; id. Ibis, 1874, p. 29; Butler & Hume, Str. Feath. 1876, p. 17; Armstrong, *t. c.* p. 344; Ball, ibid. 1878, vii. p. 228.

Shore-Sandpiper, Penn. Arct. Zool.; *Spotted Sandpiper* of some; *Sandpiper*, *Snippet*, Sportsmen in Ceylon; *Wald-Uferläufer*, German. *Kodidi*, Malay (Blyth); *Chupka*, Hind.; *Chinna-ulanka*, Telugu (Jerdon); *Junggit batang*, Borneo (Mottley); *Kotan*, Tamil.

Sili watuwa, Sinhalese.

Adult male and female (Ceylon). Length 8·4 to 8·7 inches; wing 4·8 to 5·0: tail 2·0; tarsus 1·4 to 1·6; middle toe and claw 1·25 to 1·3; bill to gape 1·15 to 1·3. This species varies much in bulk, length of bill, and tarsus, but not in wing.

Iris light or yellowish brown; bill blackish or deep black-green, with the base beneath round the nostrils greenish yellow; legs and feet yellowish olivaceous, the joints and toes darker; in some the tarsus has a prevailing greenish tint.

Winter plumage (Ceylon). Head, hind neck, upper back, wing-coverts, and tertials dark olive-brown, passing into blackish brown on the rump; the hind neck and head edged narrowly with greyish, the remaining parts with marginal whitish spots blending into the brown, and with interspaces of blackish brown; these spots are most pronounced on the longer scapulars and tertials; quills deep brown, 1st primary-shaft white; the secondaries and their greater coverts with white tips and terminal edges; centre tail-feathers brown, *closely barred* with dusky whitish; remainder white, barred with blackish brown, chiefly on the outer webs of the lateral feathers: upper tail-coverts white, the longer feathers *barred near the tip with blackish brown*; a dark stripe through the lores, supercilium, round the eye, cheeks, chin, throat, and under surface white, washed on the chest and striped on the cheeks with brown; the feathers of the chest likewise with brown striæ; lateral under tail-coverts barred

on the outer webs, and the centre feathers striped with brown; axillary plumes white, barred *distantly* with brown (in old birds the bars are almost obsolete); under wing-coverts white, scantily barred with brown.

The coloration of the chest varies; scarcely any two specimens are alike; but in general the centre part is whitish, continued down from the throat.

Summer plumage (Amoy, May, ♀). Above darker than in winter, the feathers being brownish black on the head, back, scapulars, and wing-coverts, the head striated with white, owing to the clearly defined lateral white margins of the feathers; the marginal spots and bars on the scapulars and tertials with sharper edges than in winter; the stripes on the sides of the throat, face, and fore neck are dark brown; the chest-feathers have many cross bars of brown, and the flanks and sides of the breast are barred with blackish brown; under wing more closely barred than in winter. This example measures:—wing 5·0 inches; tail 2·2; tarsus 1·5; middle toe 1·1; bill to gape 1·35. It is a large bird. An April specimen from Amoy entirely corresponds with Ceylonese examples of that date, and measures:—wing 4·8 inches; tarsus 1·35; bill to gape 1·2.

Young, nestling in down (Petchora river). Ground-colour of upper surface and wings warm fulvous buff, patched down the centre of the hind neck and back with velvety black; crown entirely black, the colour running in a point down to the bill; a stripe of the same from the bill through the eye, widening behind it; upper part of eyelid black; a black band down the centre of the wing, a broad patch on the femur, and the down of the tibia of the same colour; beneath whitish, tinged with buff across the throat.

Bill at front 0·45 inch; tarsus 0·85; middle toe 0·91 (longer than the tarsus at this stage).

Birds of the year, in the plumage in which many arrive in Ceylon, have the upper surface more spotted than in adults, the edgings of the feathers being of a fulvous hue.

Obs. The measurements of Indian examples are as follows:—(Irrawaddy delta) ♂: length 9·15 inches; wing 4·8, expanse 14·75; tail 2·1; tarsus 1·5; bill from gape 1·45. ♀: length 8·3; wing 4·85; tail 2·0; tarsus 1·55; bill to gape 1·3. (*Armstrong*.) European examples correspond with Indian and Chinese birds.

Distribution.—This Sandpiper is extraordinarily abundant in Ceylon. It arrives before the Snipe, and when it is met with in the paddy-fields in September sportsmen begin to look out for their favourite birds. It makes its appearance in large numbers during the first few days in September; but in some seasons very many are found at their usual haunts in August, early in which, in 1876, I met with it at Pusella, on the road to Ratnapura, and found it in paddy-fields under the Karawita hills a week later. It is diffused throughout all the low country, being most numerous where there are large extents of paddy-fields or many tanks. On the forest-rivers it is rarely seen, its place being taken there in small numbers by the next species. As the country is more cultivated in the west and south of the island its numbers there exceed those in other parts. According to my experience it is not at all common in the hills, except where the valleys are cultivated with paddy. To this rule, however, the recently constructed lake at Nuwara Eliya forms an exception, as I saw numbers on its borders in January 1877; prior to the existence of this water, I believe it was quite unknown in the upper hills. Some few are occasionally seen about the Colombo lake; and in April 1876 a small number frequented this locality for the whole month. At the end of April, and during the first week in May, they collect in very large flocks and fly northward during the night; and one year on the 28th of April immense numbers passed over Colombo after dark, piping loudly.

It is abundant and widely spread throughout the Indian empire, arriving in the north-west (Guzerat), according to Captain Butler, as early as the 7th of August and departing about the 12th of May. Among other places in the interior we find it recorded as common in the Deccan; and from Ahmednagar the Rev. Dr. Fairbank notes it. It is found on all the rivers in Chota Nagpur; and Mr. Ball notices it from the Godaveri valley, while Mr. Hume cites it as occurring in Raipur. In the neighbourhood of Calcutta it is so extraordinarily abundant, that Mr. Hume estimates that there, must be nearly 15,000 sold during the season in the market of that city. Notwithstanding its numbers there, I find that Mr. Cripps does not record it from Furreedpore. In the plains of Guzerat it is common, and has been obtained by Capt. Butler in summer plumage at Mount Aboo on the 8th of May. It is rare, according to Mr. Hume, in Sindh and in portions of Jodhpoor; and in Kattiawar Major Hayes-Lloyd did not notice it. The next species is much more common

in this region. Glancing eastward we find it common in Upper Pegu (Oates), and abundant in the Irrawaddy delta, where Dr. Armstrong procured it near Elephant Point. At Tonghoo Captain Wardlaw Ramsay obtained it; and according to Mr. Hume it is pretty common throughout the province of Tenasserim. It was obtained on the Pakchan in the extreme south. Further south, in the Malay peninsula, Mr. Hume notes it in his 'List' from Malacca, Pulo, Seban, and Nealys. In the Andamans it is not very common: it was found about Pt. Blair by Mr. Davison, but in the Nicobars he did not meet with it. At Acheen, North-west Sumatra, this gentleman obtained it on paddy-fields, but it was not numerous; at the opposite extremity of the island (Lampong) it has been recently procured by Mr. Everett. It appears to be generally distributed throughout Borneo. Governor Ussher procured it in Lumbidan and on Moara Island and Labuan, while in the south it is recorded from Pagattan, Banjermassing, and other places, as also from Sarawak on the west coast. Forster met with it in Amboyna and in Celebes; and in the latter island Meyer lately procured it at Menado and at Limbotto in *July*, which latter circumstance is very noteworthy. The specimen was probably immature and non-migratory for the season. In Java it is not uncommon, and was described under a new name, *T. affinis*, by Horsfield. It occurs in the Philippines, but has only been, as yet, obtained in Luzon.

As regards China, Swinhoe's remark concerning it is, "Hurries past in early autumn and returns late in spring." So that it would seem that the birds passing through there must winter further south, in Cochin China and Siam, perhaps, and in the Malay archipelago, though why the species does not lodge in China during the winter is incomprehensible. Père David says nothing about its wintering in the country, but remarks that it passes across China in great numbers, stopping often to breed in the south. In Japan it seems to be common: Whitely obtained it at Hakodadi, and Blakiston at Yezo.

Returning to the northern confines of India, we do not find Dr. Scully meeting with it at Yarkand; but in West Thibet Von Pelzeln procured it on the Gyagar Lake at an elevation of between 15,000 and 17,000 feet. Mr. Blanford ('Zool. of Persia,' p. 285) met with it in the winter months in Baluchistan, and records it from an elevation of 3000 feet near Bam in South-east Persia. In Turkestan, however, it is stated by Severtzoff to breed; and it is singular that it does not do so in Persia. I transcribe from Mr. Dresser's work a sketch of its distribution in Northern Asia:—"It is found throughout Siberia; and Kittlitz records it from Kamtchatka. Von Middendorff says that it arrived on the Boganida (lat. 70° N.) on the 29th May (O.S.), and breeds there commonly. On the 12th of May he observed it in marshy places on the west slope of the Stanowoi mountains, but did not observe it again until he reached Udskoj Ostrog, where, as also on the sea-coast and on the large Shantar Island, he met with it. Von Schrenck met with it along the Amoor, though less numerous than the Greenshank; and Dr. G. Radde obtained specimens at the Tarei-nor and on the eastern slope of the Southern Apfelgebirge. Messrs. Dybowski and Parvex met with it during passage in Dauria." To this I would add that Mr. Seebohm remarks (Ibis, 1879, p. 152):—"Next to Temminck's Stint the Wood-Sandpiper was by far the commonest Wader in the valley of the Yenesay. I shot the first on the 6th June at the Koo-ray'-i-ka, but did not meet with it north of lat. 69°." In Western Siberia Finsch found it on the Schtschutschja river, and states that it was there the most common of the Waders. In Palestine Canon Tristram noticed it in winter.

It is common along the north coast of Africa in the winter. Though numerous in Egypt, Captain Shelley found its visits irregular; it appears to be abundant in some seasons and scarce at others. Some few are said to remain throughout the year. In Algeria Mr. Gurney found it plentiful at Laghouat; and in Morocco Col. Irby noticed it in numbers about the lakes of Ras Dowra and other swamps. According to Von Heuglin it wanders southwards through Abyssinia to Sennaar, Kordofan, and Bahr-el-Abiad, ranging along mountain brooks and into upland moors to 10,000 feet. Mr. Andersson found it common in Damara Land, South-west Africa, and especially records it from Ondonga and Objimbinque. Messrs. Ayres and E. L. Layard procured it in Natal; but the former gentleman only observed it in one locality in November 1865; he also obtained it at the Cape, and he records it on two occasions from Transvaal, procuring it there in January, February, and March. On the west it has been obtained by Captain Shelley on the Gold Coast in February; and other naturalists have obtained it in Senegambia, Gaboon, and Benguela.

It is spread throughout Europe, wintering in the south, occurring on passage in the central portions, and summering in the north, where it extends to the shores of the Arctic ocean. Col. Irby has observed it frequently on passage in March, April, and May in the vicinity of Gibraltar; and Mr. Saunders shot a female

incubating near Aranjuez on the 28th of May. Messrs. Danford and Harvie Brown observed it on passage in Transylvania; and in Great Britain it is only a spring and autumn migrant, though some few perhaps remain to breed, as Mr. Hancock took a nest in June 1853, at Prestwick Car, Northumberland. Mr. Dresser writes that it has only occurred as a straggler on the west coast of Scotland; but in Elginshire, according to Mr. More, it has bred. The young just fledged have been shot in Norfolk, from which it appears that it has bred as far south as that country. In Heligoland it occurs on passage, and in the month of May has been obtained there by Herr Gätke. Mr. Seebohm met with it on the Petchora as early as the 28th of May. It was common at Habariki, but was not seen north of Stanavoialachta. It is, however, abundant in Finland far north, and also in high latitudes in Norway. According to Mr. H. C. Müller it has occurred on the Faroe Islands.

Habits.—The Wood-Sandpiper is more essentially a freshwater bird than any of its allies, except perhaps the next species. In Ceylon, to a considerable extent, it restricts itself to frequenting paddy-fields, the margins of lakes, tanks, and pools, flooded grass-land, and wet but bare marshes. When it first arrives the land is in course of cultivation, and it congregates in hundreds in the slushy ploughed fields, picking up insects, and running about over the newly harrowed soil, totally regardless of the shouts of the natives to their working buffaloes. When the fields are too wet for it to feed in it takes to the bunds surrounding the squares of tilled land, and stands motionless in little rows, allowing the sportsman to approach quite close to it, uttering its loud piping whistle as it rises, and flying round and round, till it selects another spot to light upon. Its tame disposition makes it a desirable quarry for the native hunter; and numbers are shot and brought in as "Shnāpe" to the market, where they, however, do not command the same price as the real article (Snipe), which the Cingalese invariably styles *Kaswatuwa.*

On the north-west coast about Jaffna, and likewise in the south-eastern district, it may be met with near tidal flats, on salt marshes near the margins of brackish backwaters, and on the edges of salt pans; but it is not to be found in such large flocks in any of these situations as in the paddy-fields of the interior during autumn; and it is in the spring, when the corn is growing up, that it is mostly driven to frequent these various salt waters. Its chief companions about lagoons and estuaries are the noisy Marsh-Sandpiper and the Long-toed Stint, which are both fonder of grassy salt marshes than of bare tidal flats; and in the interior the latter species is not unfrequently found consorting with it. On the large brackish lagoons or "lakes" in the south-west it may be seen with the Common Sandpiper affecting the muddy mangrove-lined shores of these large sheets of water, these two birds being about the only "Waders" to be found in these ornithologically-barren localities. It is also partial to the vicinity of the coir-pits, in common with the last species, where it finds an abundance of food in the insects which frequent these spots. When well on the wing, after being disturbed, its flight is swift, but on getting up and flying from one spot to another it is rather sluggish in its movements. After circling round and round a field, proceeding with great speed, it suddenly darts down with half-closed wings, extending them when it nears the ground, and skimming along with outstretched legs, alights in some inviting place. Its food consists of aquatic insects, shrimps, worms, &c. I have never seen it alighting on trees or fences, though sometimes it will perch, after being flushed, on a slanting stake or low inclining post. In northern parts, however, it constantly perches on trees, a habit which, after all, is not abnormal, as other species do the same. Messrs. Seebohm and Harvie Brown, in their paper on the birds of the Petchora River, write as follows:—"They were frequenting the pools in the middle of the town (Ust Zylma), and were exceedingly tame, allowing us to approach within a few yards of them. They were very common at Babariki, and we shot specimens, which had perched on the tops of high dead larches, quite 70 feet from the ground." In Borneo Mr. Mottley found it to be a freshwater bird, perching on the *batangs* (hence its name) or drift timber.

Nidification.—The Wood-Sandpiper breeds near water, nesting in grass or amongst heath. The nest is placed in a little hollow and lined with grass and bents. A nest taken by Mr. Hancock at the famous wild-fowl breeding-resort, Prestwick Car, was situated on the side of a dry hillock where grew some heath and grass in the midst of a swampy spot. The number of eggs laid is four. The eggs of this species are, on the whole, rather larger than those of the Green Sandpiper. They vary tolerably in ground-colour, but more so

in their markings; the former is pale greenish stone, brownish stone, and olive stone. As examples of opposite types, one egg is marked with large oblique blotches of rich sepia over faded spottings of bluish and reddish grey, mostly collected at the large end, where there are fine streaks of sepia; while the other is spotted throughout with small blots and specks of lighter sepia over numerous spots of bluish grey, and almost round the large end is a long streak or line of dark sepia-brown. In others the markings are intermediate in size and number, and are chiefly located at the obtuse end. The dimensions of some are—1·46 by 1·03, 1·43 by 1·0, 1·57 by 1·04 inch.

During the breeding-season this Sandpiper makes a peculiar sound while flying about over the spot where its nest is situated. Mr. Seebohm, who has heard this in Northern Siberia, is of opinion that it is vocal, and says it resembles somewhat the note of the Wood-Wren. Mr. Hancock, on the other hand, believes it to be made by the wings, in the same manner which he supposes the Snipe produces the drumming sound. He publishes some information concerning it in his catalogue of the birds of Northumberland and Durham, which I here give *verbatim*:—"The Wood-Sandpiper produces a sound perfectly comparable to the murmuring or neighing of the Snipe. I have twice had the opportunity of hearing the Wood-Sandpiper; once when I took its nest at Prestwick Car in June 1853, and again at Gosforth Lake on the 6th of May, 1857. On the first occasion I observed the bird for a long time flying in the air before the nest was found; and afterwards while watching it return, previous to shooting it. It kept at a considerable elevation, wheeling about and descending at intervals in wide circles, with outstretched, quivering wings, like a Snipe, and producing at the same time a similar tremulous note; but the motion of the wings was more rapid and the sound was shriller and more musical, amounting almost to a sort of whistle. This was repeated over and over again, and sometimes when the bird was at a great elevation. When I heard it at Gosforth it was precisely under the same circumstances; but I failed to detect its nest, though I have little doubt it was somewhere in the neighbourhood."

TOTANUS OCHROPUS.

(THE GREEN SANDPIPER.)

Tringa (ochrophus) ochropus, Linn. Syst. Nat. i. p. 250 (1766).

Totanus ochropus (Linn.), Temm. Man. d'Orn. ii. p. 651 (1820); Sykes, Cat. B. Dukhun, P. Z. S. 1832, p. 162; Gould, B. of Eur. iv. pl. 315 (1837); Kelaart, Prodromus, Cat. p. 134 (1852); Middendorff, Sibir. Reise, ii. p. 215 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Schrenck, Reisen u. Forsch. Amur-L. p. 416 (1860); Newton, P. Z. S. 1863, p. 529; Gould, B. of Gt. Brit. iv. pl. 56 (1873); Layard, B. of S. Afr. no. 612 (1867); Swinhoe, P. Z. S. 1871, p. 406; Shelley, B. of Egypt, p. 258 (1872); Hume, Str. Feath. 1873, p. 247; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1161 (1874); Irby, B. of Gibraltar, p. 167 (1875); Dresser, B. of Eur. pt. 53 (1876); Blanford, Zool. Persia, p. 285 (1876); Hume, Str. Feath. 1878 (B. of Tenass.), p. 462; Blakiston & Pryer, Ibis, 1878, p. 220; Seebohm, Ibis, 1879, p. 152; Hume, Str. Feath. 1879 (List B. of Ind.), p. 113.

Totanus leucurus, Gray, Ill. Ind. Zool. ii. pl. 51. fig. 1 (1833–4).

Actitis ochropus (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 267 (1849); Holdsw. P. Z. S. 1872, p. 474; Beavan, Ibis, 1878, p. 399; Jerdon, B. of Ind. iii. p. 698 (1864); Butler, Str. Feath. 1876, p. 18; Ball, ibid. 1878, vii. p. 228; Cripps, *t. c.* p. 303.

Bécasseau ou *Cul-blanc*, Buffon; *Greenshank*, Kelaart; *Lavandera*, Spanish (Irby). *Nella ulanka*, Telugu (Jerdon); *Tita*, Sind (Blyth); *Yamghurchi*, *Zagharak*, Turkestan (Scully); *Krungi*, Amurland (Schrenck); *Kotan*, Tamils in Ceylon.

Watuwa, Sinhalese.

Adult male and female (Ceylon). Length 9·3 to 9·7 inches; wing 5·5 to 5·75; tail 2·3 to 2·6; tarsus 1·3 to 1·45; middle toe 1·0 to 1·1; bill to gape 1·45 to 1·6.

Iris hazel-brown; bill deep brown, greenish round the nostril and at base of lower mandible; legs and feet variable—olivaceous plumbeous, greenish olive tinged with slaty, bluish.

Winter plumage (Ceylon). Head, upper surface, wing-coverts, and tertials deep olive-brown, with a strong green lustre; back, scapulars, tertials, and wing-coverts with dark shafts, and a series of alternate marginal pale and dark spots (these spots are much smaller and more inconspicuous than in the last, and the pale spots are dusky grey, and not white); quills and primary-coverts dark brown, with an olive-green gloss; upper tail-coverts *pure white*; tail white, the entire feathers with the terminal half dark brown, crossed by three *narrow white* bars, increasing in size to the outermost, which is all white, with the exception of a subterminal spot on one or on both webs, but which is wanting in some; orbits and a short supercilium white; lores and round the gape brown, the cheeks striated with white; chin and gorge, with the breast and the lower parts, white, the under tail-coverts unspotted; fore neck and chest brownish, striated with white down the centre; axillaries and under wing-coverts dark brown, with very *narrow*, *oblique*, white bars.

Summer plumage (Santander, June 1876). Plumage darker above than in winter; feathers of the head with white edgings near the tips; the upper back and scapulars with marginal spots of white; striations of the face darker than in winter; fore neck streaked with blackish; flanks and axillaries very dark brown, as also the under wing. Wing of this specimen 5·7 inches.

An Abyssinian example (15th April) has the neck more thickly striated, and the tertials spotted with fulvous grey, which is the colour of the spottings on the scapulars and upper back.

Young, in down (Wermland, 3rd June, 1869). Above rufous-buff, marked on the occiput and down the back with broad patches of black; on the crown three stripes of black; a black patch on each side of the rump, and one on the wings; tail blackish; a black stripe through the tail and above the ears; beneath white.

Three weeks old? (Sweden). Back and wings feathered, rest downy; head fulvous, with a broad frontal streak, widening on the crown of the head, and a narrow line above the eye joining the black on the occiput, and a streak through the lores widening above the ears; hind neck with a dark patch; feathers of back and wing-coverts earth-brown, with fulvous marginal spots; quills blackish brown; down of throat and neck greyish white; underparts feathered, white, with dark bars on sides of breast; tail-feathers blackish, with white subterminal band.

Bill 0·84 inch at front; tarsus 1·02; middle toe 1·02.

Obs. Examples with the outer tail-feathers wholly white are presumably old birds. In some specimens the terminal portion of the outer tail-feathers is entirely brown, in others tipped with white and crossed by a more or less complete narrow bar of the same. Dr. Scully's measurements of Kashgar examples (females) are:—Length 8·9 to 9·65 inches; wing 5·6 to 5·95; tail 2·4 to 2·6; tarsus 1·35 to 1·43; bill from gape 1·55 to 1·7; weight 2·2 to 3·3 oz. The legs in these varied from "plumbeous" to "slaty green." Kamptee and Behar specimens examined by myself vary in the wing from 5·4 to 5·6 inches, and measure in the bill to gape 1·45 inch. An Angola specimen has the wing 5·6 inches and the bill to gape 1·55.

I subjoin here a diagnosis of the characteristics of this and the last-described Sandpiper in winter plumage, for the information of field-naturalists.

Totanus glareola. Smaller: wing 4·8 to 5·0 inches. Conspicuously spotted above; longer tail-coverts barred with brown; centre tail-feathers barred with bands of brown and white of equal width; axillaries white, distantly barred with brown; under tail-coverts with cross marks of brown.

Totanus ochropus. Larger: wing 5·5 to 5·75 inches. Ground-colour of upper surface darker, with inconspicuous marginal spots; upper tail-coverts *pure white*; centre tail-feathers black, with narrow, distant, white bars; axillaries *black-brown*, with *narrow* white bars; under tail-coverts pure white.

Distribution.—The Green Sandpiper is not nearly so common as the last species; and I had been some years in Ceylon before I met with it at all. Its chief haunts are the sandy beds of rivers in the Northern and Eastern Provinces, on which it is found in pairs. I first procured it in the forest at the river flowing by the Rest-house of Palampootaar; and this was the only spot where I saw it in the Trincomalie district. I subsequently found it tolerably numerous on other rivers in the northern half of the island, and on the Deduru oya near Kurunegala it was quite common. In the Western Province the only place I identified it from its ubiquitous relation (the Wood-Sandpiper) was at Boraslasgamuwa tank. It is also found, I have been told, at Kotte and Kæsbawa. On the rivers of the south-east it is likewise met with. If searched for, it will be found on the rocky torrents of the Central Province; for I met with a pair on the Maha-Eliya river, on Horton Plains, at an elevation of more than 7000 feet, it being the only bird that I saw frequenting this mountain-stream. I am of opinion that the last species has been sometimes mistaken for it, as it has been said to be so common in Ceylon. I killed many scores of Wood-Sandpipers before I became acquainted with the note of the present bird, in the hopes of acquiring specimens of it; and after becoming familiar with its voice I could not pass it by unnoticed. I never once saw it in paddy-fields or on any salt marshes near tidal flats.

This species has not got such a wide range in the Old World as the last, as it does not seem to extend into the Philippine Islands nor the Malay Archipelago. In India it is scattered over the whole empire more or less, and is, according to Jerdon, almost more common than the Wood-Sandpiper. In the Deccan it is abundant in the cold season; and the Rev. Dr. Fairbank records it especially from Ahmednagar. From the Rajmehal hills, Manbhum, Lohardugga, Singhbhum, and Orissa it is noticed by Mr. Ball, and he elsewhere says (Str. Feath. 1874) that it is to be found on all the rivers of this region (Chota Nagpur). Mr. Cripps records it as "rather common" in Furreedpore; and in the neighbourhood of Calcutta it is very abundant. Captain Beavan procured it at Barrackpore, Julpigoorie, and Umballah, and speaks of it as being very plentiful in Bengal. In the north-west it is equally well distributed. It is common throughout the Mount-Aboo and Guzerat region, which includes Kutch, Sindh, and Jodhpoor. About the Sambhur Lake Mr. Adam found it frequenting the edges of open wells; and in Kattiawar Major Hayes-Lloyd says it is common. It is the earliest Sandpiper to arrive, writes Captain Butler, in this district, his date being the 15th of July; and it does not leave until the 12th of May. Col. Irby found it remaining in Kumaon as late as July.

Turning eastward, we find Mr. Oates recording it as common in Pegu; but it was not observed in the Irrawaddy delta by Mr. Armstrong. In Tenasserim it is not common, and is only recorded by Mr. Hume from Amherst and Thatone. From the Andamans, Nicobars, and Malay Peninsula it is wanting, in all of which localities, as we have seen, the Wood-Sandpiper is found.

Swinhoe says that it is found throughout China and Formosa, and he specifies the Hoehow Marsh in Hainan as a place which it haunts in April; he obtained it at Takow, Pekin, and Foochoo. Père David remarks that it occurs in China at all seasons. In Japan Messrs. Blakiston and Pryer say that it is common at Yezo; and here it most likely summers. It inhabits the shores of the Sea of Okhotsk, and was shot by Von Middendorff at the mouth of the Amoor on the 5th of May; a day later it was procured in the same year far up the river, on its tributary the Schilka. Schrenck procured it on the 4th of the month in question in the Stanowoi Mountains; so that the time of arrival from the south to breed in these distant northerly regions (lat. 52°–55°) must be the end of April. Mr. Seebohm shot the first example of the season (1877) on the 15th of June in the Yenesay valley as far north as the Arctic circle; and it was by no means common, he remarks, in that latitude: in August he found it abundant at Yenesaisk, further south (58° N. lat.). Col. Prjevalsky says that it occurs throughout Mongolia, except the Ala-shan mountains, and arrives there about the middle of April, but does not stay to breed, although some may be seen in the Hoang-ho valley in July. In Kan-su it was observed once in September, but never in Koko-nor. It is common in spring in Ussuri after about the 20th of April, frequenting Lake Hanka, and leaving in August. It winters in Kashgar, as Dr. Stoliczka found it common there at that season; and of its location there we further learn from Dr. Scully that it was "common near Kashgar during the first half of the winter, and was often seen at Yarkand near streams, pools, and swamps from March to August, ascending the hills to 13,000 feet in the latter month." Dr. Severtzoff writes that it occurs in winter in the district of the Thian-Shan mountains, in Turkestan, up to an altitude of 10,000 feet, and that it breeds in the same locality up to about 6000 feet. In Persia Mr. Blanford procured it at Shiraz, which has an elevation of 6000 feet above the sea; and he also notes it as being observed at 3500 feet in Baluchistan. In Palestine, where it winters, Canon Tristram saw it as late as June, long after all the Sandpipers had left. In the peninsula of Sinai it was obtained by Mr. Claude Wyatt in the winter; and Mr. Danford writes of it wintering in the ravines of Cydnus, in Asia Minor. In South-eastern Europe, though it does not breed there, it is found very late in the season, for Mr. G. C. Taylor observed it in July; and Mr. W. H. Simpson says that it remains in Greece until the breeding-season. It is a constant resident along the north of the Mediterranean, but in some places likewise remains into the summer months. In Malta it occurs on passage, but is sometimes also seen in June. At Gibraltar Col. Irby has seen it in every month except July; and he suggests that it may breed in Spain. It was obtained in Seville by Mr. Howard Saunders in January; and in Portugal it is rare, according to the Rev. A. Smith. In Macedonia it is said by Mr. Elwes to be the commonest Sandpiper which frequents the marshes there. In parts of Transylvania (Rea) it is abundant in autumn; and Herr Buda Ádám says that he has seen it in summer, but has not succeeded in ascertaining whether it breeds there or not. It is not so common in Great Britain as the Wood-Sandpiper, chiefly occurring on passage in the autumn; it occurs on both the Scottish coasts, and has been seen as a straggler in Ireland at all seasons. In France and Holland it is a migrant, as also in Southern Germany. It is a summer resident in North-east Germany, not breeding further west than Oldenburg. In Denmark generally it occurs as a migrant in spring and autumn; but some remain in Jutland in the summer. It arrives in Scandinavia in April and remains till September, being quite common in parts of the Dovrefeld, and breeding as far north as the Arctic circle. It is found rarely in Finland, and ranges in Northern Russia as far north as Archangel. Though found in the Ural range, it does not seem to breed there.

In North Africa it is rather plentiful. We have Col. Irby's authority for M. Favier's statement that it is not uncommon in the neighbourhood of Tangier, appearing in August and September from the north, and departing in February and March. Mr. Gurney found them numerous at Laghouat, in Algeria, in April; and in Egypt it is abundant and evenly distributed, according to Capt. Shelley. It arrives there, says Von Heuglin, in August and September, and then ascends the Nile; this naturalist procured it in Abyssinia and on the coast of the Red Sea, and met with it as far south as lat. 8°. On the western side of the continent it has been obtained in Gaboon; and Capt. Shelley found it plentiful at Cape Coast and Accra.

It is not uncommon in South Africa, inhabiting certain localities which are suited to its habits. Layard

writes :—"Several examples of this bird have been procured near Colesberg; it is also common at Zoetendals Vley in November and at the Knysna." Captain Shelley likewise procured it at Durban; and Mr. Barratt found it frequenting dams in the Leydenburg district. It is not included in Mr. Andersson's list of Damara-Land birds, nor has it yet been ascertained that it strays from the east coast across the Mozambique Channel to Madagascar. There is an example in the national collection from Angola; and further north on the west coast it has been obtained in Gaboon. Von Heuglin records it doubtfully from the Canaries.

Habits.—This fine Sandpiper somewhat resembles the last species in its deportment and general habits, but is not so gregarious; in fact it is for the most part found singly or in pairs, or three or four frequenting the same spot in scattered company. I have generally found it very shy and difficult to get within gunshot of, unless by stalking it; and when doing this I have had experience of its very watchful nature, for it would take flight before I had any idea that my murderous intentions were discovered. On forest-rivers, however, I have come upon it standing beside the limpid pools, in their sandy beds, quite tame, allowing a near approach before rising with its loud cry; it would then fly off, passing down the natural avenue of stately trees, and speedily realight, often returning, after being flushed again, by a circuitous flight to its first position. At the Horton Plains it was exceedingly wary, and I failed to procure a specimen. Its note is a much louder pipe than that of the Wood-Sandpiper, and it may be recognized from that species, especially on the wing, by the contrast of its white rump and much darker tail. Its flight is swift and vigorous, the intervals of rest characteristic of its aerial progress being composed of arrow-like glancings, which carry it on with great speed. Like its congeners it is sedate in its movements, not running like the Stints, but proceeding hither and thither, taking a few quick paces, and then stopping to pick up some insect, tiny snail, sand-fly, or earth-worm. Its flesh is excellent, which cannot be said of that of the Wood-Sandpiper, which is dry and flavourless.

Col. Irby writes of it, as observed in the Gibraltar district, that it is extremely irregular and uncertain in its movements, changing its ground continually. "They fluctuate," he remarks, "greatly in numbers; days elapse without seeing a single bird, and suddenly several appear; but they are seldom observed in any greater number than two or three together; generally they are solitary in habits, and without exception frequent stones of freshwater lakes, ponds, and streams." Mr. Dresser remarks that Naumann has found in "its stomach, in April, a reddish larva about as thick as a knitting-needle, and numbers of a small thread-like white maggot intermixed with a greenish substance."

Nidification.—As this species breeds in Turkestan it may possibly do so in Cashmere, Kumaon, and other sub-Himalayan localities, where it has been observed far on into the season for nesting. Its eccentric habit of nesting in the deserted habitations of other birds (which has probably been acquired from the circumstance of its summer habitation at the time that it first came into existence having been subject to inundation) may have caused its nest to be overlooked in districts where it is found in breeding-time. This abnormal nidification was made known about a quarter of a century ago by a German writer, Herr Wiese, who gave an account of the Green Sandpiper's nesting in Pomerania in the 'Journal für Ornithologie,' 1855. His article was the subject of a notice by Professor Newton in the P. Z. S. 1863, p. 529, from which I extract the following particulars:—"In the 'Journal für Ornithologie' for 1855 Herr Wiese, writing on the ornithology of Pomerania, especially in the district of Cöslin, says that he had first heard from an old sportsman, who knew the peculiarities of all the forest-animals, that the *Totanus ochropus* nested in old Thrushes' nests, which information, he remarks, 'I naturally did not believe;' but he states that some years after, in 1845, he obtained from the same man four fine eggs of a bird of this species, which for many years had been wont to nestle in an old beech tree. Still doubtful on the subject, the following spring he himself found a nest of the bird on a pine which had a fork about 25 or 30 feet high. 'Joyfully,' he says, 'I climbed the tree, and found in that fork four eggs on a simple bed of old moss.' In the spring of 1853 he again obtained four eggs of the same species; and on the 25th of May, 1854, he found four others placed in the old nest of a Song-Thrush, out of which the shed buds of the beech had not so much as been removed."

In the 'Journal für Ornithologie,' 1862, Mr. Hintz, a Swedish forester, published an account of all the nests which he had taken, the first having been found by him as early as 1818. These were principally the old habitations of the Song-Thrush; but some had been laid in those of the Pigeon and the Jay, one in that of

a Butcher-bird, and another in a hole in which a pair of Flycatchers had previously bred. One nest was in a fir, about 18 feet from the ground; but the usual height was from 3 to 6 feet, and all were close to the water's edge. Mr. H. W. Wheelwright, the "Old Bushman," has taken the nest not unfrequently in Sweden; and recently Mr. Seebohm found one on the Yenesay, in lat. 67° N., in a willow tree, about 6 feet from the ground, containing one egg.

The eggs are pale whitish green and pale brownish stone, some specimens between these two types having a slight olive tint in the ground-colour. The markings are *small*, and consist of specks and roundish blots of sepia-brown, mixed with short strokes or marks of the same, under which are light spots of purplish grey and bluish grey; the small end is nearly as much marked as the large. In size some are 1·57 by 1·1 inch, and others 1·52 by 1·14. The series before me is in the collection of Mr. Dresser, and was taken in Northern Europe.

Subgenus TRINGOIDES.

Bill with the groove extending quite to the tip. Legs rather short. Tail longer than in *Totanus*.

Of small size and almost solitary habit; and with scarcely any change of plumage in the summer.

TRINGOIDES HYPOLEUCUS.

(THE COMMON SANDPIPER.)

Tringa hypoleucos, Linn. Syst. Nat. i. p. 250 (1766).

Actitis hypoleucos (Linn.), Ill. Prod. Syst. Mam. et Av. p. 262 (1811); Gould, B. of Eur. iv. pl. 316 (1837); Blyth, Cat. B. Mus. A. S. B. p. 267 (1849); Schrenck, Reisen u. Forsch. Amur-L. p. 417 (1860); Schl. Mus. P.-B. *Scolopaces*, p. 80 (1864); Jerdon, B. of Ind. iii. p. 699 (1864); Gould, Handb. B. of Austr. ii. p. 263 (1865); Layard, B. of S. Africa, no. 616 (1867); Holdsw. P. Z. S. 1872, p. 474; Shelley, B. of Egypt, p. 258 (1872); Henderson & Hume, Lahore to Yarkand, p. 289 (1873); Gould, B. of Gt. Brit. iv. pl. 58 (1873); Legge, Ibis, 1874, p. 29; id. J. A. S. (Ceylon Br.) p. 53 (1874); Scully, Str. Feath. 1876, p. 188; Seebohm & Harvie Brown, Ibis, 1876, p. 292; Ball, Str. Feath. 1878, vii. p. 228.

Totanus hypoleucos (Linn.), Temm. Man. p. 424 (1815); Sykes, Cat. B. Dukhun, P. Z. S. 1832, p. 163; Kelaart, Prodromus, Cat. p. 134 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Irby, B. of Gibraltar, p. 168 (1875); Dresser, B. of Eur. pt. 61, 62 (1877).

Tringoides hypoleucos (Linn.), G. R. Gray, Gen. B. p. 88 (1841); Swinhoe, P. Z. S. 1871, p. 406; Salvadori, Ucc. di Born. p. 326 (1874); Von Heuglin, Orn. N.Ost-Afr. ii. p. 172 (1873); Hume, Str. Feath. 1874, p. 299; Walden, Trans. Z. S. 1875, ix. p. 234; Hume, Nests & Eggs, iii. p. 588 (1875); Armstrong, Str. Feath. 1876, p. 344; Hume, *t. c.* p. 465; Blanford, Zool. Persia, p. 285 (1876); Davison & Hume, Str. Feath. 1878 (B. of Tenass.), p. 463; Hume, ibid. 1879 (List B. of Ind.) p. 113; Blakiston & Pryer, Ibis, 1878, p. 220.

Actitis empusa, Gould, B. of Austr. vi. pl. 35 (1848).

Guinetta, Brisson; *Petite Alouette de mer*, Buffon; *The Common Longshank* (!), Kelaart; *The Summer Snipe* in England; *Sandpiper, Snippet*, Sportsmen in Ceylon; *Andarios*, Spanish (Irby). *Potti ulanka*, Telugu (Jerdon); *Tilla, Musda*, Sindh (Blyth); *Trinil batu*, Java; *Junggit-junggit*, Borneo (Mottley); *Kiboranto*, Madagascar (Newton); *Alouette*, Seychelles (Newton); *Krungi, tschitsche*, Amoor Land (Schrenck); *Kotan*, Ceylonese Tamils.

Watuwa, Sinhalese.

Adult male and female (Ceylon). Length 7·8 to 8·2 inches; wing 4·2 to 4·5, expanse 13·5; tail 2·25; tarsus 0·9 to 1·0; middle toe and claw 0·97 to 1·02; bill to gape 1·02 to 1·15.

Iris brown; bill deep brown or dark plumbeous, the base yellowish or pale beneath; tibia, knees, and feet dusky greenish; tarsi greenish grey, in some immature birds pale bluish.

Winter plumage (Ceylon). Upper surface, from head to tail, including the scapulars, tertials, and wing-coverts, olive-brown glossed with green, less on the head and hind neck than elsewhere; all the feathers with a dark brown shaft-stripe, broader on the upper back and scapulars than on the hind neck, and expanding on the interscapular region into a central patch; scapulars and tertials pencilled near the tips with black; wing-coverts and lower back with many cross marks of brown, some of the greater series with white tips; primaries and secondaries olive-brown, the former with the basal portion of the inner webs white, extending to the second quill, and in some only to the third; tips of the secondaries white; shaft of the 1st quill whitish near the tip; winglet and primary-coverts with white edges to the outermost feathers; central tail-feathers with a dark tip, remainder

pale brown, with deep white tips, a subterminal band of dark brown, and the outer webs barred with brown, the white predominating on the lateral feathers; a whitish supercilium extending forward to the bill; through the lores a brown stripe continued behind the eye; cheeks and sides of neck greyish brown, with dark central stripes; sides of the chest brownish; chin, fore neck and under surface, the upper part of throat, and from the centre of the chest to the under tail-coverts unmarked; the fore neck with narrow brown shaft-streaks; axillary plume and median under wing-coverts pure white; lesser under wing-coverts white, with dark bases.

Summer plumage. Male (Cardiganshire, June). Length 7·8 inches; wing 3·0, expanse 9·3; tail 2·3; tarsus 1·0; middle toe 0·82; bill to gape 1·1.

Bill olive-brown, tip blackish, lower mandible and gape pale olivaceous fleshy, tip dusky; legs and feet pale leaden grey, toes tinged with yellowish.

Head and upper surface a darker brown than in winter, and illumined with a more brilliant green lustre, equally strong on the wing-coverts and back; the interscapular region, scapulars, and tertials with wavy cross bars of brown; rump unmarked; upper tail-coverts crossed with brown; white portion of the inner web almost obsolete on the 2nd primary, and much smaller on the 3rd than the 4th; face, ear-coverts, and loral stripe darker than in the above; stripes of the fore neck and chest bolder, and these parts washed with brownish; stripes also present on the chin.

Obs. The darker and more glossy summer dress is acquired, as in other Scolopacine birds, by a change of colour; but a partial moult takes place, as in other genera, in the spring. I have March examples killed in Ceylon with here and there a new feather. Schrenck, in writing of Amoor-river specimens, notices that the white patch on the inner webs of the primaries extends to the 2nd quill, while in European examples it terminates at the 3rd. There *is* doubtless a tendency to more of the white coloration in Asiatic birds than in European; but the latter frequently have the white patch on the 2nd quill in a greater or less degree, and yearling birds in Ceylon only have a small amount of white on that quill, so that, to a certain degree, it is a characteristic of age.

Young (nestling in down). Ashy grey, mottled with black on the back, and with a central stripe down the back; through the lores a black line, and another on the head.

Bird of the year (September, Ceylon). Bill blackish brown, base slaty; legs and feet slaty greenish, toes dusky. Brown of the head and back darker than in adults, and the head and hind neck with the shaft-stripes indistinct; the feathers of the back, scapulars, and wing-coverts with regular subterminal blackish-brown bars and buff-grey tips, the barring broadest on the scapulars and wing-coverts; upper tail-coverts marked in the same way, but not so boldly; the ground-colour of the lateral feathers wholly white, barred completely across with blackish brown; secondaries very deeply tipped with white, and the inner primaries narrowly tipped with the same; frontal feathers edged with whitish; fore neck less conspicuously striped with brown than in adults; towards the middle of the season (*January*) the whitish or buff tips wear off, and in the following *March* the immature plumage is chiefly noticeable on the wing-coverts. The yearling barred and tipped dress is not fully acquired until September, specimens shot in that month still having partly green tail-feathers.

Obs. There is considerable variation in the colour of the light tipping on the wing-coverts. In a large series of immature birds examined in the Swinhoe collection from China, I find that they are buff in some specimens and whitish in others. A dozen individuals in this series vary in the wing from 4·0 to 4·5 inches. Indian and Yarkand specimens fall within my Ceylonese limits of measurement.

Tringoides macularius, the Spotted Sandpiper, is the American representative of this species.

Distribution.—This elegant and widely-spread Sandpiper is very abundant in Ceylon, being diffused throughout all the low country, and an inhabitant of the borders of streams and rivers in the Central Provinces up to a general altitude of 3000 feet. Since, however, the Nuwara Lake has been formed, it finds its way to that elevated locality. On the Maha Eliya, at Horton Plains, I did not meet with it; but it may occasionally be found there. It is a winter visitant to Ceylon, arriving very early in August, and departing as late as the last week in May or beginning of June. At Colombo I have seen it during the first week in June, and at Kandelay tank on the 3rd of August, by the end of which month a good many used to be seen about Trincomalie. It would seem, therefore, that it can scarcely migrate to Northern Asia in so short a time; and I can hardly believe that some do not remain throughout the year in the island, though it

cannot be expected that they would breed there. It has never come under my notice in July; and during a tour I made through the tank-districts in that month I made particular search for it, but without success. As many breed in Cashmere, it may be assumed that it is to that region these birds, which are so short a time absent from the island, resort for the purpose of nesting. All round the coast, and even about the Colombo Lake and on the sea-shore near the town, this Sandpiper is common; and on the salt-lagoons of the west and south coasts it is invariably seen. It affects the rivers of this part of the island far inland; but not so much those which traverse the forests in the east and north of the island, although there is no saying where one will not meet with a pair in wandering through these jungle-wilds; and as to the shores of the large tanks, they are a favourite haunt. In the Central Province it is locally diffused, and at Nuwara Eliya was met with by Mr. Holdsworth in February.

In the Laccadive Islands it is very common, as Mr. Hume observed it on all the islands he visited. Throughout the Indian empire it is generally distributed; but Jerdon did not find it so common as the Wood- and Green Sandpipers; he found it usually about the shores of tidal rivers, canals, and on the pebbly banks of rivers. Far inland, in suitable localities, it can scarcely be less plentiful than in the maritime regions. In the Deccan it is said to be common; and Dr. Fairbank records it from Ahmednagar. It is found on all the rivers in Chota Nagpur, writes Mr. Ball; and he notes it from the valley of the Godaveri. About Calcutta it does not seem to be so common as its above-mentioned allies; and from Furreedpore it is not recorded. Captain Beavan found it less plentiful in Lower Bengal than the Green Sandpiper. In Guzerat, writes Captain Butler, it occurs round the edges of most of the tanks between Deesa and Ahmedabad; and his dates of its arrival and departure are the 4th of August and the 20th of May. In Sindh Mr. Hume occasionally met with it, and about Karachi and Hyderabad it is not uncommon. In the Sambhur-Lake district it is rare. Further north in Cashmere it is common in the breeding-season, and all along the base of the Himalayas it is to be met with. Mr. Brooks records it from Derali in the valley of the Bhagarati.

In Pegu it is said to be common; and Mr. Oates has met with it there in August. In the Irrawaddy delta it is not abundant (*Armstrong*); but in Tenasserim it is common everywhere, both inland and on the coast. It is abundant in the Andamans, not departing, according to Mr. Davison, before the middle of May, and returning again during the latter half of August. Mr. Hume's remark on it would well apply to Ceylon; he says, "From Preparis to Galatea Bay the Common Sandpiper was the *one* bird that, wander where one might along the coast, it was impossible to avoid seeing." In the Malay peninsula it is recorded from Kopah, Malacca, and Chopong; and at Singapore it is not uncommon; it has also been procured in the Nicobar Islands. It inhabits the entire eastern coast of the continent, summering in Japan between the months of April and August, and affecting all the rivers there, residing likewise in China throughout the year, inhabiting the islands of Hainan and Formosa, and extending eastwards to the Philippines, throughout which group it is evidently diffused, for recently the islands of Cebu, Luzon, Mindanao, and Camiguin have been added to its habitat by various naturalists. Further east still it has been obtained by Dr. Finsch at the Pelew Islands. It is spread entirely throughout the Malay archipelago, and, as time goes on, will probably be recorded from every island in that vast group. At present it is recorded from Sumatra (where Mr. Everett likewise recently procured it), Java, and Bangka; likewise from many parts of Borneo (where it was obtained in Sarawak in August) and from Labuan; also from Flores, Ceram, Timor, Amboina, and Celebes. In the latter island Dr. Meyer procured it recently at Limbotto in July, and in the adjacent Tongian Islands in August, from which it is to be inferred that immature birds remain there occasionally throughout the year. It has further been obtained in Halmahera, Morotai, Batchian, Waigiou, and New Guinea; from the latter island it has been recorded by several naturalists; and recently Mr. L. Stone met with it at Port Moresby. It is spread throughout the entire coast-line (as far as it has been explored) of the vast island-continent of Australia, extending to Tasmania. It has not been met with, according to Mr. Ramsay, anywhere in the interior.

From India northwards it wanders in the summer up to the Arctic circle, spreading eastwards to Kamtchatka, and westward to the northern limits of Europe. Between Kashmir and Yarkand, Dr. Henderson procured it on the Sujet Pass at an altitude of 17,000 feet; and Dr. Scully saw it on the banks of the Karakash, Sanju, and Arpalak rivers; but neither he nor Dr. Henderson met with it on the plains of Kasgharia. Severtzoff says that it breeds throughout Turkestan. According to Prjevalsky, it breeds on the rivers of

S.E. Mongolia, and is common on the Hoang-ho, but does not occur in Ala-shan. In Kan-su and Halha he met with it on its autumnal migration, and found it very abundant in the Ussuri country. Middendorff met with it on the Stanowoi Mountains, North-eastern Siberia, nearly as high as the crest of the range, and obtained it in August on the south coast of the Sea of Okhotsk. Schrenck found it abundant on the Amoor river; and Maack procured it on the Schilka. It has been noticed on the shores of Kamtchatka; and Von Heuglin says it has been obtained at Krajak, south of Alaska. On the Yenesay Mr. Seebohm shot the first example of this species on the 12th of June, and "found it frequent on the banks of the river wherever he went."

Mr. Blanford met with it in Persia on the Elburz mountains at an elevation of 7000 feet, and in Baluchistan at Rampur.

My space prevents me doing more than glancing at its European distribution. It is a common bird throughout the continent, migrating, as I have above remarked, to the extreme north, and frequenting the southern portion in the winter. It arrives in England at the end of March, breeding in many counties as well as in Wales and Scotland, and departing again sometimes in September; but it has been obtained, writes Mr. Hancock, as late as the 16th of November. At the Straits of Gibraltar, Col. Irby records it as arriving in October and November, and found it very abundant in April on passage north from Africa; some remain, he thinks, to breed, as he has seen them in May, in which month, likewise, Lord Lilford observed it in the Castilles. "It is the most common of the Sandpipers," according to Favier, in Morocco; and he has seen it on passage south as early as August. In Egypt Captain Shelley found it resident and evenly distributed throughout that country and Nubia. Von Heuglin says it is resident on the White and Blue Nile, in Abyssinia, in Kordofan, and on the Gulf of Aden, but less common in summer than at other seasons; he did not find its nest, but believes that it breeds in the country. It has been found round the whole African coasts to the extreme south, and is even recorded from the Sahara. It appears to be locally diffused, and perhaps not abundant, along the extensive coast-line, as I observe that Governor Ussher did not procure it on the Gold Coast, although it is recorded by Hartlaub from that region. It is scarce in the Transvaal, according to Mr. Ayres; in the Cape colony, according to Layard, it is likewise so; it was obtained on the Cape flats and near Cape Town, and he met with several at Zoetendals Vley. It is found in Madeira and throughout the Canary Islands; Mr. Godman says it nests in Teneriffe, but he does not record it from the Azores. It wanders eastward to Madagascar, where Mr. E. Newton found it common on the east coast in September and October. He writes that it inhabits Mauritius from September until April; and he met with it in the Seychelles, on the island of Mahé, in January.

In Southern Greenland it has been observed; but I am not aware that it has been detected anywhere on the east coast of America.

Habits.—One cannot but regard this most graceful Sandpiper with admiration, not only on account of the extreme elegance of its form and the vivacity of all its actions, but also owing to its wonderful ubiquity, and from the knowledge of the fact that its tiny form graces the sandy shores and coral reefs of distant continents and remote islands, as much as it does the banks of our hill-streams in cultivated England and the forest-bound shores of Ceylonese tanks. It generally associates in pairs, or in little scattered troops of three or four, and is usually a very tame bird. It may be seen running along the shores of the Colombo lake, close to the road on which scores of vehicles are hourly passing, or flying from rock to rock on the Galle Buck, uttering its clear shrill piping note, and often mounting up to the rampart of the bastion, where it will run to and fro for an instant, oscillating its elegant form with a regular up and down motion of the tail. It will then, perhaps, fly off to the rock which rises from the water a little distance from the shore; and as the long monsoon swell laves its surface and almost covers it at each passing wash, the little Sandpiper trips to and fro, avoiding the wave or fluttering up for an instant till it has passed over, when it will realight with its merry trill, as if defying the ocean's sway. Such is its habit all round the coast of Ceylon—at home alike on beach and rock, and ever restless, perpetually flying to and fro, and constantly uttering its pleasant whistle, both as it rises and while it runs about on *terra firma*. Should a pair be haunting the same spot, a little distance from one another, they answer each other, and often fly to meet one another, joining in a conjugal twittering as they alight. On the sandy beds of forest-rivers it delights to run round the little pools or along the insignificant stream which is all that is left of the broad torrent of the rainy season; and here it finds abundance of

flies, insects, and aquatic larvæ to feed upon. In the west and south of Ceylon a favourite haunt is a reeking bed of cocoanut-husks in process of decomposition for coir-manufacture, at the side of a brackish lagoon; it runs over this and catches the numerous flies attracted by the unpleasant odour of the coir.

It is fond of frequenting the same spot throughout the season, taking up its quarters where it first lodges on arrival, and remaining there till it migrates again. In May these birds collect in little troops before leaving the west coast of Ceylon, and are then very noisy and more restless than ever. Its usual note is a *trēet-treet-treet*, the first syllable being drawn out more than the others; but in the spring and during the breeding-season it keeps up a constant jingling or trilling note, uttered so quickly that when three or four birds are together a singular consonance of sound is produced. Its flight is peculiar, being a succession of little skims in the air, the result of several rapid strokes of the wings, succeeded by a little interval with the wings motionless.

A pair frequented the beach beneath the ramparts at Fort Frederick, Trincomalie; and I once witnessed them carrying on a singular performance, not during the breeding-time, but in the month of November. They strutted to and fro, with their tails spread out and inclined to the ground, now and then making a little run at each other, suddenly dropping the wings, after which they would retire; and becoming more excited after a little while, they commenced to dart forward to the attack with wings trailing on the ground, heads stretched up, and tails erected vertically over their backs, which final display terminated in a violent pecking at each other. There had evidently been some grave difference of opinion, and they had determined to have the matter settled by an appeal to arms!

Dr. Armstrong noticed it in the Irrawaddy delta, chiefly in ploughed fields, on cultivated land, and on the margins of jheels. It is the exception in Ceylon to find it in fields, as its place is entirely taken there by the equally ubiquitous Spotted Sandpiper. In Great Britain, where it breeds, it is found by the side of streams and round the borders of lakes and mountain-pools. It frequently perches on fences; but, unlike the other members of its family, who only practise this habit in the breeding-season, and chiefly in northern climes (where it was evidently first contracted), the present species does so constantly; and the fact of its having been seen in this position has more than once given rise to the report that Snipe have been seen in England perching on fences. It is, however, quite possible (it may be well here to remark) that Snipe *may* have been seen in England perched on elevated objects when excited during breeding-time, for we have evidence of their doing so in Northern Europe.

In Africa Von Heuglin has noticed it perching on ships' rigging, as well as on bushes overhanging streams. Col. Irby remarks that it is fond of places where much seaweed has been thrown up by the tide.

Nidification.—I have no evidence of the Common Sandpiper breeding in Ceylon; but it is *possible* that an occasional pair may nest in the upper hills, although I do not know that it has been seen there in July. In India it breeds during the month of May, nesting by the streams that run through the Cashmere valley, particularly the Sindh river. Captain Cock thus describes its nest:—"It is placed a few yards from the water in an open situation in stray localities amongst sage-bushes. It is usually on the ground in a slight depression, generally to the north of a low bush, and consists of a few little pieces of stick or a few fragments of dead leaves. It always contains four eggs, the pointed ends of which are placed together in the centre. The bird gets off the nest very slowly, as if it wished to attract attention to itself."

Last June I visited a nest situated near an upland lake in Wales, where a number of these birds were breeding. It was placed on the hill-side, about 10 yards from the edge of the water, and was constructed of dead pieces of the common rush, laid in a hollow in the moss and grass made by the bird beneath a tuft of rushes. The bottom of the nest was fully 3 inches thick, and the egg-cavity tolerably deep and about $2\frac{1}{2}$ inches in diameter. It had previously contained four eggs; but they were hatched off about the 3rd of June. The young, when pursued, take to the water and swim well. In the lake in question they have been seen to swim right out from the shore, and cross over an arm of it to the other side. Although the nests are usually situated a little away from the water, the eggs are sometimes laid in shingle near the water's edge. They are of the usual pointed or pyriform shape and are stone-buff in ground-colour; and the markings, writes Mr. Hume, are a rich red-brown, in some cases so intense that they are almost black, and consist of specks and spots more or less intermingled with and underlaid by spots and small clouds of reddish, or in other cases

pale inky purple; they sometimes are confluent round the larger end, and are never very large or bold. He gives the average of eggs found in India as 1·46 by 1·06 inch.

A fine series in the collection of Mr. Seebohm, from Europe, vary in colour from greyish buff to stone-white. Some are marked at the large end with large blotches of deep brownish red, the rest of the egg having small specks and marks of the same openly distributed over the surface, under which are numerous primary markings of bluish grey: others have no large blotches, but are openly spotted with brownish red and bluish grey; they have the appearance of pointed eggs of the Rallidæ, the ground-colour being exactly that of some of the eggs of that family. They vary in length from 1·38 to 1·53 inch, and in breadth from 1·0 to 1·1.

Genus MACHETES*.

Bill moderately long, flexible, slightly curved, the tip somewhat bent down; upper mandible channelled nearly to the tip, gape placed far forward; nostrils linear, near the base. Wings long, pointed, with the 1st quill the longest. Tail short. Legs moderately short. Tarsus exceeding the middle toe and claw, and protected with transverse scutes. Toes moderate; outer connected to the middle by a small web; hind toe small.

Male much larger than the female; neck furnished in the breeding-season with a handsome outspreading ruff, and the lores with small tubercles.

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* The genera *Machetes*, *Tringa*, and *Calidris* (Sanderling) are placed by some authors in the subfamily Tringinæ: the differences in the feet of each of them from those of the members of the group just dealt with are, however, merely generic.

MACHETES PUGNAX.

(THE RUFF.)

Tringa pugnax, Linn. Syst. Nat. i. p. 247 (1766); Middendorff, Sibir. Reise, ii. p. 218 (1853); Schlegel, Mus. P.-B. *Scolopaces*, p. 51 (1864); Legge, Ibis, 1878, p. 204 (first record from Ceylon).

Tringa equestris, Lath. Ind. Orn. ii. p. 730 (1790).

Totanus pugnax (Linn.), Nilss. Orn. Suec. ii. p. 71 (1817).

Machetes pugnax (Linn.), C. L. Brehm, Vög. Deutschl. p. 670 (1831); Gould, B. of Eur. iv. pl. 328 (1837); Shelley, B. of Egypt; p. 246 (1872); Gould, B. of Gt. Brit. iv. pl. 61 (1873); Durnford, Ibis, 1874, p. 399; Irby, B. of Gibraltar, p. 170 (1875); Seebohm & Harvie Brown, Ibis, 1876, p. 292; Blakiston & Pryer, Ibis, 1878, p. 221; Hume, Str. Feath. 1878 (B. of Tenass.), p. 460; Dresser, B. of Eur. pts. 69, 70 (1878); Hume (List of Ind. B.), Str. Feath. 1879, p. 112; Seebohm, Ibis, 1879, p. 151.

Philomachus pugnax (Linn.), G. R. Gray, Gen. B. p. 89 (1841); Blyth, Cat. B. Mus. A. S. B. p. 270 (1849); Jerdon, B. of Ind. iii. p. 689 (1864); Layard, B. of S. Africa, no. 619 (1867); Hume, Str. Feath. 1873, p. 239; id. Lahore to Yarkand, p. 287 (1873); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1180 (1874); Butler & Hume, Str. Feath. 1876, p. 17.

Le Chevalier varié, Buffon, Hist. Nat. Ois. vii. p. 517; *Chevalier commun*, Buffon; *Greenwich Sandpiper*; *Equestrian Sandpiper*, Latham; *Combatiente*, Spanish (Saunders); *Kamphaan*, Dutch; *Kampf-Strandläufer*, German; *Bajnok Bíbicz* ("Champion Plover"), Transylvania (Danford). *Geh wala*, Hind.; *Chonchili*, Sindh (Blyth); *Habib el tchibib* ("the friend of the Godwit"), Moorish.

Adult male. Length 12·0 to 13·0 inches; wing 7·2 to 7·4; tail 3·0 to 3·3; tarsus 1·7 to 2·1; middle toe 1·2 to 1·3; bill to gape 1·4 to 1·6. "Weight 6 oz." (*Jerdon*).

The above measurements are taken from a large series from Siberia, Holland, and Northern Russia. There is but little variation, except in the tarsus, in which a considerable difference in size is apparent. The average length of wing is 7·2 inches.

Iris dark brown; legs and feet dusky fleshy yellow; claws black; facial tubercles or warts yellowish.

Male in breeding-plumage (*black* variety, Yenesay valley, lat. 70½°, July). Throat, fore neck, chest, and upper breast black, glossed on the neck and ruff with a steel-blue and green lustre; the feathers at the upper part of the side of the neck are elongated and descend to the shoulders, forming a large ruff; forehead and face covered with minute warts; the crown, nape, hind neck, and interscapulars with the feathers mottled with purple-black, increasing on the back into conspicuous patches; the plumes below the nape slightly elongated and joining the ruff: scapulars rufous-buff, the feathers marked with longitudinal patches and terminal patches of black; wing-coverts light brown, pale-edged; the innermost greater coverts and elongated tertials concolorous with the scapulars; primaries brown, with white shafts; secondaries paler, tipped with white, and with the inner webs whitish; the tertials with a conspicuous terminal black patch; back olive-brown, the feathers slightly pale-edged; some of the upper tail-covert feathers rufous-yellow with black tips; tail brown, the four centre feathers tipped with black, and the central pair much mottled with rufous-yellow; the extremities of the feathers white; abdomen, vent, lower flanks, and under tail-coverts white; on each side of the breast there is an elongated tuft of feathers, which are black with white margins; axillaries and under wing white, marked along the edge with brown.

White variety (same locality and date). Head, throat, fore neck, ruff, and elongated nuchal feathers white; the throat,

head, and sides of the ruff tinged with buff, and speckled on the head and nape with black; chest and flank-plumes blue-black, some of the feathers partly white; abdomen, flanks, and under tail-coverts white; hind neck and scapulars creamy white, handsomely dappled with black, many of the feathers with a terminal patch of the same, tertials barred with black and rufous-buff; some of the innermost greater coverts buff, mottled with black; wings as in the last; back brown; tail brown, the outer feathers with black subterminal bars and indentations of buff; face much more feathered than in the last; under wing white.

The above examples furnish instances of the two extremes of coloration in this extraordinarily variable phase of plumage. Between these two every conceivable variety of plumage exists*. Light varieties are perhaps more common than black; the backs of these are mostly rufous-yellow or buff, more or less extensively marked with black. The following is the colouring of some of the ruffs, including the head and throat:—

(*a*) Throat and ruff white; head and nape tawny yellow, mottled with black.

(*b*) Throat, ruff, and head white, the former boldly barred with shining blue-black; head striped and the nape mottled with the same (scapulars the same, and the back barred with black and tawny).

(*c*) Throat and ruff white; neck ferruginous; head and hind neck purple-black.

(*d*) Head, neck, and ruff light ferruginous; throat white (under surface white, patched with black and tawny).

(*e*) Head and nape rusty buff, mottled with black, paling on the throat and ruff into buff barred with black rusty-edged bands (back and scapulars rusty buff, handsomely marked with crescentic black bands).

(*f*) Head, neck, throat, and ruff creamy white, with a black gorget, and the ruff-feathers with terminal spots of black; hind neck speckled with black.

Of the dark varieties the following may be instanced:—

(*a*) Ruff and neck black; chin, head, and nape white, the latter with mottlings and shafts of black.

(*b*) Head and nape green-black; throat, fore neck, and ruff black, with narrow wavy bars of white (breast, interscapulars, and scapulars coal-black).

(*c*) Head and nape black, with many ferruginous cross lines; throat, neck, and ruff rich rusty buff, barred with black.

Adult female. Wing 5·8 to 6·3 inches; tail 2·4 to 2·6; tarsus 1·5 to 1·6; bill to gape 1·25 to 1·4.

(Valley of the Petchora, June.) *No ruff*; head, hind neck, back, and wings brown; the head and centres of the hind-neck feathers very dark, with pale edges; wing-covert feathers likewise pale-edged; scapulars black, tipped with whitish, and margined laterally with dusky buff; quills and primary-coverts dark brown; secondaries tipped with white; lateral upper tail-coverts white, the centre feathers blackish brown, barred with rufous and white; tail brown, the lateral feathers mottled with black and tawny yellow on the outer webs; chin whitish; fore neck whity brown, washed with rufescent, many of the feathers with two black subterminal spots; underparts dusky white, greyish on the chest and flanks, with a few blackish rufous-margined feathers at the sides of the chest.

Females vary a good deal in summer plumage. A July specimen from the Yenesay has the upper surface, rump, scapulars, and wing-coverts chiefly black, the hind-neck feathers margined with rufous-grey, and scapulars, upper tail-coverts, and wing-coverts handsomely marked with crescentic bars of rufous; chin and throat buff; fore-neck feathers black, with rufous-grey tips. Another from the Lower Petchora has the head fulvous, striped with black; the hind neck, scapulars, tertials, and wing-coverts black, with clearly defined edges of rufous-buff, recalling somewhat the markings of a Snipe; throat white; fore neck brownish fulvous, the feathers being brownish grey, tipped with fulvous.

Adult male (winter). Wants the ruff and facial warts; chin white; fore neck greyish brown; upper surface brown, the feathers centred with blackish, and the scapulars often handsomely marked with black and edged with rufous; interscapular region with triangular dark marks; central tail-feathers edged with rufous; the fore neck, chest, and flanks generally with dark bars, edged with rufous-buff.

Young, nestling. Above greyish buff; a broad black stripe down the back, with a white mesial line, and on each side a broad band of white; head with a diamond-shaped black mark, divided by a central stripe; a dark stripe through the lores and ear-coverts and passing round the nape; nape brown, with a dark bar across the hind neck, and two lateral ones continued along the side of the body to the rump, where they widen, forming, with the aforesaid

* Montagu, in his interesting account of a visit to a fowler in the fen-districts, says (Orn. Dict. p. 443), "We were shown into a room where there were about seven dozen males and a dozen females; and of the former there were not two alike."

central one, three dark longitudinal bands; beneath whitish; thighs mottled with brown. Bill at front 0·66 inch; tarsus 1·13.

Young, just fledged. Breast and flanks tinged strongly with fulvous; the head still in down: brown, mottled with buff; feathers of the back and scapulars blackish brown, with broad buff margins on all but the interscapulary region, where the edgings are narrow and rufous; wings brown, greater coverts broadly tipped with white: secondaries the same; lesser wing-coverts tipped with dull buff.

1*st autumn* (*male*). Wing 7·1 inches. Throat and under surface white; sides and front of neck, breast, and chest uniform tawny grey, blending into the white; head brown, the feathers edged with rufous; hind neck brownish grey, lower part with the interscapulars and scapulars black-brown, with buff edgings to the feathers; tertials margined with rufous; wing-coverts broadly margined with buff, the tips being white; tail dark brown, with buff indentations at the outer edges. In an older male specimen shot in February at Kirinde, Ceylon, the wing-coverts are only edged with fulvous; the wing measures 7·2 inches, tail 2·7, tarsus 1·9, bill at front 1·4.

Obs. The Ruff in winter plumage, in which dress it will alone be found in Ceylon, might perhaps be mistaken for the Large-billed Stint (*Tringa crassirostris*) by those who are not well versed in this family of birds; but it may be distinguished always by the somewhat *curved* bill and peculiarly forward position of the gape. *T. crassirostris*, which is about the same size, has a straighter and longer bill and shorter legs; it will be found noticed in my article on *Tringa subarquata*.

Distribution.—For the introduction of this interesting and well-known bird into the present work my readers are indebted to my friend Capt. Wade-Dalton, 73rd Regt., who met with the only specimen yet recorded from the island at the Bundala Lake near Kirinde in February 1877. It is not unlikely that, being a bird of wandering disposition and extensive southerly range in the breeding-season, it may now and then visit Ceylon, and will no doubt be procured on future occasions within its limits. The south-east coast of the island constitutes by far the most southerly Asiatic point which the Ruff has yet reached in winter.

It is a bird of wide European, African, and Asiatic distribution, but, singularly enough, does not extend to China or the islands to the south-east of that Empire.

Jerdon states that it is found "in large numbers in India during the cold season;" but I imagine it is rare in the south. This author does not state any locality; and recent observers, with the exception of Mr. Davidson, have not seen it in the peninsula. He procured a "specimen from a small flock which arrived at Pundharpur in September 1877, and saw another large flock towards the end of that month." Its visits so far south are evidently uncertain, although it may now and then be found in considerable force. Again, towards the east it seems to be local. Messrs. Ball, Blanford, and Cripps do not make mention of it; but Mr. Hume writes that it is rather common about Calcutta, large numbers being brought to the market at the close of the season. Blyth likewise speaks of specimens with growing ruffs being shot at Rajmehal. In the north-west, where it first arrives from Western Asia, it is abundant in the autumn, winter, and spring; bnt, according to Mr. Hume, is less common in the two latter seasons than elsewhere. It is plentiful in marshes between Ahmedabad and Deesa, writes Capt. Butler, and appears as early as the end of July. Mr. Hume learns that at the close of the inundation in Sindh large flocks appear, disappearing in about a month. He met with it at the Kunkrowlee tank in Oodeypore. Mr. Adam says that it visits the Sambhur Lake in large flocks during the cold weather. Col. Irby met great numbers in Oudh and Kumaon. Eastward of the Bay of Bengal it is a mere straggler, not having been, as yet, recorded from Pegu or Burmah, and only having been once met with in Tenasserim at the mouth of the Sittang river.

It breeds, without doubt, in Kashgharia, as Dr. Henderson states that it was very common near the city of Yarkand, many specimens being obtained in August and September, when the males had lost their ruffs, but not all breeding-plumage. Dr. Scully does not seem to have noticed it in this region, so that perhaps it is not a regular breeder there. At the Panir Lakes, westward of Yarkand, Dr. Stoliczka met with it in April before the ice had broken up. In Turkestan, according to Severtzoff, it occurs on passage throughout the country up to an altitude of 4000 feet or thereabouts; but Prjevalsky does not seem to have met with it in any of his travels in the Mongolian region.

It extends in the summer as far north as Kamtchatka. In North-eastern Siberia Von Middendorff met

with it on the Taimyr river in lat. 73°, and on the 27th May saw them in great numbers on the Boganida, where they had come to breed. Schrenck does not record it from the Amoor. In Japan it is rare, but one specimen being spoken of by Messrs. Blakiston and Pryer as having been obtained in Yezo. In the Yenesay valley Mr. Seebohm found it common; he shot the "first on migration on the 9th of June on the Arctic circle," and afterwards met with them, as far north as he travelled, in the swamps on the tundra. Dr. Finsch saw it with young on the lakes which dot the low marshy ground on the borders of the Kara Bay. It has been procured in Arabia; Mr. C. Wyatt shot a few about Tor, in the district of Sinai, and Antinori found the young in Asia Minor, near Ephesus, in the month of July. It is found in winter, and on passage in the spring, in the islands of the Mediterranean—Cyprus, Crete, Sicily, Malta, and Sardinia. It leaves Italy for the north at the end of April; but in Andalucia Col. Irby has noticed it as late as the last week in May. In Southern Spain it is common in autumn, writes Mr. Saunders. In Southern Russia and Turkey it occurs on passage. Mr. Durnford found it breeding in North Frisia; and thence northward to Finmark and Lapland is its ordinary breeding-ground, although it occurs in Heligoland only in spring and autumn. Messrs. Seebohm and Harvie Brown met with it at Ust Zylma as early as the 30th of May, and found its eggs at Habariki on the Petchora on the 12th June; further north at Alexievka, at the mouth of the river, they saw flocks on the 9th of July. The Ruff used to be a common bird in the fens of Lincolnshire, where it bred in great numbers; but drainage has driven it almost out of the county, and in some localities it is never seen in the present day. Mr. Hancock found it breeding at Prestwick Car; but this locality has been long since drained. Some still breed in Norfolk; and it is also found on the east coast of Scotland (*Dresser*).

Turning southwards to Africa we find Mons. Favier recording it as a bird of passage in Tangier, crossing to Europe in March, and returning in August and September. In Algeria it also occurs on passage. Further east, according to Captain Shelley, "the Ruff is very abundant throughout Egypt and Nubia from August until May, more especially in the Fayoom and the Delta, where it may generally be met with in large flocks, frequenting the flooded fields in preference to the marshes." According to Von Heuglin it is to be found in some part or other of North-east Africa throughout the year. In autumn, winter, and spring it is very common in Nubia, Sennaar, Takah, and East Kordofan, and ascends into the Abyssinian highlands to an elevation of 10,000 feet; and in July and August he shot it at the Bitter lakes near Suez in full summer dress. In West Africa it has been obtained in Senegambia and Benguela; and further south it is found in winter in Damara Land, as regards which country Mr. Andersson writes:—"This bird generally appears in Damara Land with the return of the rainy season, when it is not uncommon, and leaves again before the ruff of the male bird is put forth; but I have reason to believe that it is to be met with in the Lake-regions during the intervening period. It is chiefly found inland, and but rarely on the coast." In Cape colony Layard records it from Colesberg, the Knysna, and Traka, and he himself obtained it on the Cape flats. Further north, in Natal, it was procured by Ayres.

Turning, now, towards the northern hemisphere again we find that it has been met with in Iceland; and Professor Baird states, in the 'Birds of North America,' that it has been frequently killed in Long Island. That it strays, however, into the Neotropical region is much more remarkable; for we have evidence as to its having been obtained in South America on Von Pelzeln's testimony, who states, in 'The Ibis,' 1875, that he inspected a skin submitted to him by an eminent taxidermist in Vienna, Herr Hodĕk, and which was collected by Herr Münzberg in Guiana. I have communicated with Herr von Pelzeln on this matter, and he kindly informs me that there is no doubt that Herr Münzberg did procure the specimen in question somewhere in the territory between the Orinoco and the Upper Rio Negro, as the collection in which it was, and which was made in that region, was forwarded to him by Herr Rohrdorff, who lived in Venezuela. It is certainly one of the most remarkable instances known of the isolated occurrence of a species so far beyond its normal habitat.

Habits.—During the winter season the Ruff frequents damp land, marshes, flooded fields, &c. In Egypt Captain Shelley noticed that they affected the last-named locality in preference to marshes. They, however, locate themselves in India round the edges of jheels and tanks, and are also found on brooks, streams, and rivers. Ruffs and Reeves consort together in large closely packed troops, and do not appear to associate with

other Waders. Von Heuglin observes that they often fly about at some distance from their feeding-grounds, dashing about with a rapid Starling-like flight. Their food consists of insects, snails, worms, &c.; and they likewise eat grain, feeding, according to Jerdon, greedily on rice. The Ruff is noted for the boldness of its disposition and the tremendous pugnacity of its nature during the breeding-season; and it is during this time that its habits are so interesting, and have always furnished so much material for the pen of the naturalist. Its innate boldness is displayed from its earliest youth. The late Mr. H. Durnford writes as follows on his observations of it in North Frisia :—"We observed some noble battles amongst the Ruffs, who, unless fighting, stand bolt upright, like Owls. When engaged in combat they stoop and charge like Gamecocks. The Reeves are silent except when they have young; and then they will fly slowly round one, with a low guttural note. On Föhr we observed one which, from its anxiety, betrayed the fact of its having young. We retired behind the sea-wall, glasses in hand; and after waiting a few minutes, three young ones ran out from the grass, and then a fourth. Leaving my brother to watch, I jumped up and ran to catch them. They all scuttled away; and I could only secure one, the others escaping in the long grass. However, we again retired to watch, behind the bank, and had not been there half a minute before they ran out again and began to feed with their mother. I merely mention this incident to show their bold and fearless natnre."

Mr. Dresser writes as follows touching the Ruff's habits :—"Its flight, when not encumbered with the ruff, is tolerably swift and direct; but the ruff appears to be a considerable hindrance; and it is always careful to avoid getting the wind behind these feathers, for it is then scarcely able to steer itself. Its note is low, and is seldom heard except during passage, and consists of tones like the syllables *kack, kack, kick, kack.* Unlike most of the Waders, it is a very tough and hardy bird, and will often get away with a good deal of shot in it; and when wounded and caught alive it will frequently recover and thrive well. When caught it soon becomes reconciled to captivity, and almost at first feeds greedily.

"When the breeding-season commences the males collect (or '*hill*,' as it is called) and fight, probably for the possession of the females; but though their actions are fierce, and they appear to contend with great ardour, they seldom harm one another. They are polygamous; but, as a rule, it would seem that a male shows greater preference for, and attaches himself more especially to, one favourite female."

Large numbers of these birds used to be caught in the Lincolnshire fens and fattened for table. They were captured by fowlers, who lived an obscure life in out-of-the-way places on the fens, and who sold them to feeders, some of whom were noted for their cleverness in fattening them for the tables of the rich. Montagu gives a long account, in his 'Ornithological Dictionary,' of the manner in which the Ruff was taken, alluding to some of the most celebrated feeders who were in the trade in his time. I extract the following from his notes :—"The manner of taking these birds is somewhat different in the two seasons. In the spring the Ruffs *hill*, as it is termed; that is, they assemble upon a rising spot of ground contiguous to where the Reeves propose to deposit their eggs; there they take their stand at a small distance from each other, and contend for the females, after the nature of polygamous birds. This hill, or place of resort for love and battle, is sought for by the fowler, who, from habit, discovers it by the birds having trodden the turf somewhat bare, though not in a circle (as usually described).

"When a hill has been discovered the fowler repairs to the spot before the break of day, spreads his net, places his decoy-birds, and takes his stand at the distance of about 140 yards or more, according to the shyness of the birds.

"The net is what is termed a single clap-net, about 17 feet in length and 6 feet wide, with a pole at each end. This, by means of uprights fixed in the ground, and each furnished with a pulley, is easily pulled over the birds within reach, and rarely fails taking all within its grasp; but in order to give the pull the greatest velocity the net is (if circumstances will permit) placed so as to fold over with the wind; however, there are some fowlers who prefer pulling it against the wind as for Plovers. As the Ruffs feed chiefly by night, they repair to their frequented hill at the dawn of day nearly all at the same time; and the fowler makes his first pull according to circumstances, takes out his birds, and prepares for the stragglers who traverse the fens, and who have no adopted hill; these are caught singly, being enticed by the stuffed birds."

Captured birds were sometimes used as decoy-birds; but usually the fowlers had recourse to very rudely stuffed skins, some of which, writes Montagu, were managed "so as to be movable by means of a long string, so that a jerk represents a jump (a motion very common amongst Ruffs, who at the sight of a wanderer flying

by will leap or flirt a yard off the ground), by that means inducing those on the wing to come and alight by him."

Nidification.—The Ruff, as far as Asia is concerned, breeds almost entirely in the far north. It is one of the species which does not nidificate in Turkestan, and perhaps does not do so regularly in Kashgharia. It has been known to lay as early as the first week in May; but the usual time is during the first half of June. Von Middendorff took the first eggs on the Boganida, North-east Siberia, on the 15th of June; and on the 12th Mr. Seebohm got his first lot near the Arctic circle, on the Petchora, in Russia. In lower latitudes the time is earlier. Mr. Durnford met with young on one of the North-Frisian islands at the beginning of June. The nest is placed on a little hillock in a marsh on a large tuft of coarse grass, or on "a stump in the most swampy places surrounded by coarse grass" (*Montagu*). The grass in which the nest is situated composes the material for the nest. The number of eggs laid is four; they are pointed ovals and vary in ground-colour. The prevailing colour is pale olivaceous, some being inclined to stone-colour and others to a greyish tint. They vary much in marking, and also in shape, though they are in character pyriform. Some are marked all over the large end with very large smeary clouds of rich dark sepia mingled with underlying *dark* bluish-grey washes, accompanied, at the small end, by a few small blots. In others all the large blotches are confined to the large end, where they are close together, but not confluent, while over the rest of the egg are small blots and specks of black-brown very sparingly distributed. In one egg the entire markings almost consist of the primary or underlying bluish-grey colouring in different shades. The dimensions of some in a series before me are 1·83 by 1·32 inch, 1·79 by 1·25, 1·76 by 1·14, and 1·74 by 1·18.

Genus TRINGA.

Bill slender, flexible, moderately long, or not shorter than the head, usually straight, in some slightly curved; upper mandible channelled at the sides, the tip pointed and depressed; nostrils lateral and elongated. Wings long and pointed; the 1st quill the longest. Tail short, even or cuneate. Tarsus moderate, slender, scutellate in front. Toes divided to the base; hind toe and claw small.

Sternum expanding posteriorly, the outer notch wide and deep, the inner small and narrow. Mostly of small size; of gregarious habit; with a marked breeding-plumage.

TRINGA SUBARQUATA.

(THE CURLEW STINT.)

Scolopax subarquata, Güldenst. Nov. Comm. Petrop. xix. p. 471 (1775).

"*Numenius subarquata* (Güld.)," Bechst. Orn. Taschenb. p. 276, pl. 21 (1803).

Tringa subarquata, Temm. Man. ii. p. 609 (1820); Horsf. Trans. Linn. Soc. xiii. p. 193 (1821); Gould, B. of Eur. iv. pl. 328 (1837); Blyth, Cat. B. Mus. A. S. B. p. 269 (1849); Layard & Kelaart, Prodromus, Cat. App. p. 61 (1853); Middendorff, Sibir. Reise, ii. p. 220 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Schrenck, Reisen u. Forsch. Amur-Lande, p. 421 (1860); Jerdon, B. of Ind. iii. p. 689 (1864); Schlegel, Mus. P.-B. *Scolopaces*, p. 31 (1864); Layard, B. of S. Africa, no. 621 (1867); Holdsw. P. Z. S. 1872, p. 474; Shelley, B. of Egypt, p. 254 (1872); Hume & Henderson, Lahore to Yarkand, p. 288 (1873); Hume, Str. Feath. 1873, p. 242, et 1874, p. 297; Adam, *t. c.* p. 339; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1193 (1874); Irby, B. of Gibraltar, p. 172 (1875); Legge, Ibis, 1875, p. 402; Blanford, Zool. Persia, p. 284 (1876); Scully, Str. Feath. 1876, p. 187; Armstrong, *t. c.* p. 342; Cockburn, *t. c.* p. 510; David & Oustalet, Ois. de la Chine, p. 472 (1877); Dresser, B. of Eur. pt. 67, 68 (1878); Hume, Str. Feath. 1878 (B. of Tenass.), p. 460; id. ibid. 1879 (List of Ind. B.), p. 113; Seebohm, Ibis, 1879, p. 150.

Schœniclus subarquatus (Güld.), Gould, B. Austr. vi. pl. 32 (1848).

Ancylocheilus subarquatus (Güld.), Gould, Handb. B. Austr. ii. p. 256 (1865).

Pelidna subarquata (Güld.), Salvadori, Ucc. di Born. p. 322 (1874).

Alouette de mer, Buffon; *Cape Curlew*, *Red Sandpiper*, *Pygmy Curlew*, Latham; *bogenschnäbliger Schlammläufer*, German; *Krasnogrudka*, Russian, N.E. Siberia (Middendorff); *Niutscha*, Amoor Land (Schrenck); *Sandpiper*, *Snippet*, Sportsmen in Ceylon; *Curlew Sandpiper* of some. *Yamghurchi*, *Kugnak*, Turkestan (Scully); *Kotan*, Ceylonese Tamils. *Watuwa*, *Oliya*, Sinhalese.

Adult male and female (Ceylon). Length 8·0 to 8·6 inches; wing 5·05 to 5·2, expanse 15·8 to 16·2; tail 1·8 to 2·1; tarsus 1·15 to 1·3; middle toe and claw 0·9 to 1·05; bill to gape (straight) 1·45 to 1·62.

Note. The bill is slightly curved throughout in this species; it varies considerably in length, and somewhat in the amount of curvature.

Iris brown; bill black or deep green-black; legs and feet blackish leaden.

Winter plumage (Ceylon). Above with the wing-coverts and tail light cinereous brown, darkening on the rump and above the ulna, the feathers with dark shafts and edged narrowly with whitish, chiefly on the hind neck and median wing-coverts, and least so on the back and lesser coverts; quills and their coverts darkish brown, paler on the inner webs; the inner primaries broadly edged at the centre, and the secondaries and their coverts tipped with white; shafts of the 1st quill white, except at the base, the next two white near the tips; rectrices edged with the same; a dark band through the lores, in general blackish at the eye; supercilium, orbits, lower part of face, chin, throat, and all beneath upper tail-coverts and under wing-coverts white; sides of head and neck striped with brownish; the chest overlaid with a grey wash, and the feathers striped with brown. In some examples the upper tail-coverts do not seem to lose the blackish bars and stripes peculiar to the summer dress.

Summer plumage (Yenesay valley, lat. 66½°). *Male.* Wing 5·1 inches; tail 2·2; tarsus 1·2; middle toe and claw 0·95; bill to gape 1·5.

Fore neck and its sides, chest, breast, and flanks uniform glossy chestnut-red; all round the base of the bill and on the

face and lores dappled with whitish; sides of the chest scantily spotted with blackish; tips of the feathers above the abdomen whitish; vent and under tail-coverts white, most of the covert-feathers crossed with two black bars, and washed near the tip with light rufous; hind neck and interscapulars chestnut-red, the centres of the mantle-feathers glossy black, those of the hind neck with narrow blackish centres; top of the head nearly all black, the feathers merely margined with rufous; scapulars black, handsomely indented and edged with bright rufous and tipped with white; wings darker brown than in winter, some of the greater coverts patched with rufous, and the larger tertials, which are black, edged with it; centre of the lower back blackish brown, the feathers edged with whitish; the sides of the rump white; upper tail-coverts white, boldly barred with black; tail darker brown than in winter, the centre feathers edged with white, with a dark inner border; under wing white, as in winter.

The specimen here described is in remarkably beautiful plumage, and was procured by Mr. Seebohm at Koo-ray'-i-ka, in the Arctic circle.

Obs. This plumage is acquired in a very gradual manner, commencing in Ceylon as early as the end of February; the dark mesial lines on the interscapular region and scapulars become black, and expand by degrees over the feather; the chest-stripes are similarly affected, and the breast-feathers acquire a light brown bar across the middle, and at the same time the upper tail-coverts become dark-centred; a month later rufous edgings appear on the upper plumage, and large lateral spots of the same on the scapulars, and the portion of the feathers *anterior* to the dark bars changes into rufescent.

A partial moult of the body-plumage takes place while this change of feather is going on; but the new feathers also undergo a change of colour after appearing, thus assuming the complete nuptial character. The primaries, as in all other members of this family which I have examined whilst in a state of change to summer plumage, are not moulted at this season; they are changed in these birds but once a year, and that immediately after nesting, when, by a supreme effort of nature, they are all moulted at the same time, and the bird is ready for its long journey south at an early period in the autumn. Instances occur, however, and notably in connexion with this very species, in which individuals which are known only to breed in the north have been obtained in southern latitudes in breeding-plumage so early in the autumn that they must either have left their breeding-grounds prior to moulting to winter dress, or, lingering behind, have never reached them on their northern journey.

Young. The nestling plumage of this species has not, that I am aware of, been described.

An example in partial first-autumn plumage was obtained by me near Chilaw in October. The back-feathers are dark brown with fulvous edgings, and the scapulars have dark subedgings and rufescent-grey margins; the tail-feathers are the same, but the upper tail-coverts are pure white; the lower back-feathers are darker brown than in the adult, and the wing-coverts are conspicuously margined with pale greyish; throat fulvous white; lores and ear-coverts brown. The slaty-brown feathers of the first winter-livery are appearing among those here described.

The Dunlin (*T. alpina*), which somewhat resembles this species in size, but cannot be mistaken for it, has not yet been detected in Ceylon, although it is common in India in the cold season. The bill is slightly curved at *the tip only*, and measures 1·2 inch at front. In winter it is grey-brown above, with the *rump*, *upper tail-coverts*, and central tail-feathers brownish black; the chest is streaked with brown. In summer plumage the scapulars and interscapulars are bright rufous, centred with black, the feathers margined with rufous; the fore neck and chest striated with blackish brown, and the breast coal-black. Wing 4·4 to 4·6 inches; tarsus 0·9 to 1·05.

The large Stint (*T. crassirostris*) will perhaps some day occur in Ceylon, as it is found in India, Java, and Australia. Mr. Hume gives the wing as varying from 7·1 to 7·3 inches, tarsus 1·4 to 1·55, bill at front 1·6 to 1·85. It is ashy grey above, with the throat striated with brown and the breast spotted with brown, and is the *Schœniclus magnus* of Gould's 'Birds of Australia.'

Distribution.—The Curlew Stint is a very abundant species in Ceylon, arriving, for the most part, at the end of September and beginning of October, during which latter month its numbers increase considerably. It is very plentiful in the north and on the north-west coast down to Puttalam, and equally so in the Trincomalie district and all places on the east coast where there is an abundance of ooze and tidal foreshore. In the south-east of the island it is very numerous; and this is the only part of Ceylon where I have found numbers of barren individuals during the breeding-season. In June and July 1873 it was quite common about the leways near Hambantota: these were evidently birds which had been bred the year before; and it may be a characteristic of this species that numbers of second-year birds do not breed. It is noteworthy that one specimen which I shot on the 28th of June, and which was engaged in a display of conjugal manners when I came upon it, presented interesting signs of an effort of nature to assume the breeding-dress. The feathers of the inter-

scapular region were black-centred, likewise the upper tail-coverts and the fore neck; and there were dark cross pencillings on the breast; but not a sign of rufous anywhere, showing that the bird had made an advance towards a change and then stopped.

I have found it on the islands of the Negombo Lake; and it is occasionally seen, I believe, about Panadure and at the mouth of the Kaluganga; but it is only a straggler to this part of Ceylon. It restricts itself entirely to the vicinity of salt-water, as far as my observations tend to prove, for I have never seen it far inland. Some individuals do not leave the island until May, in which month examples evidently about to migrate have been procured in breeding-plumage by Mr. Holdsworth.

The Curlew Sandpiper possesses a vast range, and in this respect scarcely yields the palm to the Dunlin, for though it does not extend over so much of the American continent, it migrates far south into Australia, which the latter does not. In India it is mostly a sea-coast bird, not being found, as a rule, in the interior, except on passage or in the case of non-breeding birds, an instance of which latter occurring in the Deccan is given by Messrs. Davidson and Wender, who obtained two or three at Sholapore in *June* 1874. It is common about Calcutta, being, according to Mr. Hume, more numerous there than the Dunlin. In Burmah it does not seem to be common, and has not been noticed, so far as I can ascertain, anywhere of late years but at the mouth of the Rangoon river, where Dr. Armstrong met with it. In Tenasserim it occurs along the whole sea-board, but is nowhere plentiful. It is likewise found, says Mr. Davison, in small flocks round the coasts of the Andaman Islands, and he saw it also at Great Nicobar. Individuals have been shot in this group in June and July in winter plumage, testifying further to the number of non-breeding birds of this species which remain throughout the year in the tropics.

It is found in the interior of Bengal on passage; and a pair were shot recently on the 17th of May at Allahabad by Mr. Cockburn. It is said to be common in Bengal by Jerdon; but Mr. Hume is of opinion that the Dunlin has been mistaken for it, although I must say it is difficult to see how any species could be confounded with the Curlew Stint, for in its large size and curved bill it is essentially different from any one of the small Stints inhabiting India. On the Sambhur Lake it is found in small numbers in the cold season, and has been obtained on the 21st May in full breeding-plumage by Mr. Adam. Its frequenting this place, 400 miles inland, in the cold season may perhaps be explained by the fact that the lake is salt, which causes birds passing it in autumn to remain throughout the summer. The same writer affirms that he shot specimens in full breeding-plumage in the first week in August at this same locality; and this extraordinary circumstance may perhaps be explained on the assumption that they returned before moulting from their breeding-grounds, or, as remarked above, that they lingered on migration, having acquired their nuptial plumage too late to reach the north. On the Sindh and Mekran coast Mr. Hume found it pretty abundant; and Major Hayes-Lloyd observed it in numbers on the shores of the Gulf of Kutch.

Dr. Henderson found it common in the marshes near Yarkand in August; and Dr. Scully procured it in October at the same place, telling us also (on native authority, I conclude) that it breeds in Eastern Turkestan. Severtzoff mentions, however, that it occurs only on passage in the north-eastern, south-eastern, and north-western divisions of the country, and is not found above an elevation of 4000 feet. In Persia Mr. Blanford did not meet with it; but it is found, according to Pallas, in spring on the Caspian. It probably migrates down the valley of the Ob to its mouth; but the Stint seen by Finsch on the Yalmal Peninsula, to to the eastward of Obdorsk, and recorded by him ('Ibis,' 1877, p. 61) as this species, now turns out to be the Dunlin. In the valley of the Yenesay Mr. Seebohm met with it at Koo-ray′-i-ka, on the Arctic circle, but saw nothing more of it; and he concludes that it bred nearer the sea than he was able to get. Further north Von Middendorff observed it arrive on the Taimyr river, in lat. 74°, on the 4th of June, and mentions that it dispersed at once over the tundras for breeding. On the Boganida river it arrived earlier, being seen there on the 27th of May. In Amoor Land it was only met with once by Schrenck, who obtained a young bird on the Ussuri river. It is not recorded from Japan; but on the Chinese coast it is a bird of passage, and was procured in May by Swinhoe, in partial summer dress, both at Amoy and Formosa. Prjevalsky states that a few birds were seen by him in the Hoang-ho valley in summer; and in the Ussuri country one was seen by him at Lake Hanka. Père David also met with it in Mongolia in summer plumage, and it was seen in great numbers on passage on the coasts of China. It extends through the Malay archipelago, but does not take in the Philippines in its passage. It has been obtained at Singapore and in Java, but not in Sumatra; and in

Borneo it has been shot in the province of Sarawak by Doria and Beccari, and at Pontianak by Diard. On the south coast of New Guinea it has been met with; and Mr. Ramsay records it from Port Essington, the Gulf of Carpentaria, and Cape York. It likewise visits the entire coast of the island-continent of Australia, and has occurred in Tasmania. Gould obtained it on Rottnest Island in Western Australia, and also at Port Macquarie, New South Wales. Some examples have been shot in this region in summer plumage, and these are, perhaps, the birds which occur so late in India in this dress; Gould says that the change takes place at the opposite season to that in which it occurs in Europe; he does not, however, state the month, and the specimens referred to may have been killed in March.

On the eastern shores of the Mediterranean it does not seem to be common. Canon Tristram records it from Palestine in winter, and Lord Lilford procured it in Corfu. In South-eastern Russia and on the Volga and Kama rivers it is met with on passage; but it goes very far north (as in Siberia) to breed. It was procured on only one occasion by Messrs. Seebohm and Harvie Brown at Dvoinik. It visits Lapland and Scandinavia in the summer, and is found in North Germany on passage. Mr. Durnford met with it in the North-Frisian Islands on the 30th of May, but found that it had disappeared by the 7th of June. It is chiefly an autumn visitant to the east coast of England. It is stated to have bred in Scotland; but Mr. Hancock thinks the eggs of the Dunlin have been mistaken for those of this species. It is not uncommon in spring in Transylvania, and has been obtained there in breeding-plumage. The same is the case in Southern Spain, says Mr. Saunders, where it is chiefly observed on passage in the spring. Col. Irby has seen it in great numbers in Andalucia at the end of April, and found it in good breeding-plumage by the 20th of that month. Lord Lilford also obtained it in summer dress in May on the Guadalquivir; and Mr. Dresser saw quantities in the market at Barcelona. It is stated by Mr. A. Brooke to be common during the winter in Sardinia. In Tangier it is an April and September migrant; it is recorded from Algeria, and likewise from Egypt, where it is rare, according to Capt. Shelley, who mentions the occurrence of two specimens only. Von Heuglin says it occurs in autumn, winter, and spring on the banks of the Nile and its tributaries southwards to Kordofan, Sennaar, and Habesch. It is more common, however, he says on the coasts of the Red Sea and Persian Gulf, and is met with in summer at Suakin and Massowah. It extends down the east coast to the Cape, and has been procured at Zanzibar and Mozambique, and also in Madagascar. It has been obtained in Natal; and Ayres recently met with it in the Transvaal in the month of February. Layard says that it is abundant along the shores in the winter, and great flocks affect Robben Island and the mouth of the Salt River. He likewise remarks that he met with it in great numbers at a place called Fagy on the east coast, within 1½ degree of the line. Andersson records it from Walwich Bay in Damara Land; and it has been obtained in every district along the west coast which has been ornithologically examined. I find it recorded from Benguela, Gaboon, the Gold Coast, Bissao, and Gambia. In the island of Madeira it was observed by Mr. Vernon Harcourt.

In Iceland it has been found, according to Von Heuglin, and in America it occurs as a straggler. Dr. Brewer informs Mr. Dresser that about twenty individuals have been from time to time captured, nearly all in the vicinity of New York.

Habits.—This fine Stint, though it is fond of frequenting sand banks, ooze, and foreshore left bare by the tide, is frequently found on salt marshes near the lagoons and estuaries on which it has taken up its winter abode; and I have seen a little flock on dry rising ground a few hundred yards away from the water's edge. It associates in Ceylon with *Tringa minuta* and *T. subminuta*; but when found in such company is generally single or in a small troop of three or four. When collected in little flocks of six to two dozen or more it is almost always unaccompanied by other species, and feeds gregariously in close company, the whole walking nimbly about as they pick up their food. It does not run about as much as its smaller relatives, feeding more after the manner of a Sandpiper than a Stint. At Jaffna in March I found it in large scattered flocks mixed with Mongolian Shore-Plovers, but not associating with them in a marked manner. The birds met with in the Hambantota district in the breeding-time were in little troops of five or six, and were frequenting the mud flats surrounding the half-dried leways. I obtained a pair (one of which has been already alluded to as having slight signs of the summer dress) which were at a little distance from a small company of their kind, and were engaged in bowing to one another and strutting about in the performance of a little quadrille. These birds had evidently paired and were engaged in courtship; yet they were not about to breed, as I found

on dissection, and the female was in perfect winter plumage. The flight of this species is very strong, and when going down-wind they proceed with great speed; the white rump is very conspicuous when they are on the wing. Their note is in tone like that of *T. minuta*, but it is stronger. The diet I have always found to consist of small aquatic insects; and the flesh of this Stint is very good eating. Dr. Saxby publishes some interesting notes on the species as observed in the Shetland Isles, and remarks that when they mix with Dunlins they cease thinking of their own movements, leaving themselves entirely under the direction of their new friends. At high water he found that they resorted to stubble-fields to repose, and were so little on the alert that they would allow themselves to be walked up to before taking notice of the intruder. He writes:—"I once winged a Curlew Sandpiper from a mixed flock; and as it fell upon a small shingle bank surrounded by the water, about a dozen of its own species, separating themselves from the Dunlins, alighted upon the shingle and began feeding; and when I threw stones over them, wishing to drive the wounded bird into the water, so that it might drift ashore, the only effect was to cause them to crouch down as if a Hawk were passing over; and it was not until I had waded within a few yards of them that they flew off and rejoined their late companions."

Nidification.—The Pygmy Curlew doubtless breeds in the extreme north of Siberia, as on the Taimyr river Von Middendorff killed a specimen in June with a partially-shelled egg in its oviduct; but he did not succeed in finding the eggs, the discovery of which, together with those of the Knot, yet remain to reward the labours of some adventurous ornithologist. An American writer has lately announced the taking of this Stint's eggs in Greenland; but Captain Feilden is of opinion that they have been mistaken for the Dunlin's.

TRINGA MINUTA.

(THE LITTLE STINT.)

Tringa minuta, Leisler, Nachtr. Bechst. Nat. Deutschl. i. p. 74 (1811); Gould, B. of Eur. iv. pl. 332 (1837); Middendorff, Sibir. Reise, ii. p. 221 (1853); Kelaart, Prodromus, Cat. p. 134 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Jerdon, B. of Ind. iii. p. 690 (1864); Sharpe & Dresser, B. of Eur. pt. 7 (1871–72); Holdsworth, P. Z. S. 1872, p. 474; Hume, Str. Feath. 1873, p. 242; Adam, *t. c.* p. 396; Legge, *t. c.* p. 491; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1189 (1873); Hume, Str. Feath. 1874, p. 298; Legge, Ibis, 1875, p. 402; id. Str. Feath. 1875, p. 205; Butler & Hume, ibid. 1876, p. 17; Armstrong, *t. c.* p. 342; Seebohm & Harvie Brown, Ibis, 1876, p. 294, pl. vii.; Hume, Str. Feath. 1878 (B. of Tenass.), p. 461; Ball, ibid. 1878, vii. p. 228; Hume, ibid. 1879 (List B. of Ind.), p. 113.

Pelidna minuta, Boie, Isis, 1826, p. 979.

The Little Sandpiper, Latham; *The Dwarf Sandpiper*, Kelaart; *Zwergstrandläufer*, German; *Kunaku*, Samoyedes on the Taimyr river (Middendorff); *Krungi* in Amoor Land (Schrenck). *Chota pan-loha*, Hind. (Jerdon); *Kotan*, Ceylonese Tamils.

Winter plumage (Ceylon). *Adult male and female.* Length 5·8 to 6·1 inches; wing 3·6 to 3·95; tail 1·6 to 1·8; tarsus 0·8; middle toe and claw 0·75; bill to gape 0·7 to 0·75, at front 0·71 to 0·76.

Iris brown; bill black; legs and feet deep leaden, in some with the centre of the tarsus pale or greenish.

Head, back, and wings greyish brown, darkening into blackish brown on the lower back, and into black on the upper tail-coverts; the centres of the feathers on the light portions dark brown, occupying a considerable portion of the feather on the back and scapulars; least wing-coverts uniform brown; quills blackish brown, the shorter primaries edged, and the secondaries and greater coverts (the latter very broadly) tipped with white; all the primary-shafts white; tertials and centre tail-feathers sepia-brown, edged with fulvous-grey, the remaining tail-feathers gradually paler to the outermost; a dark stripe through the lores; above it a broad supercilium extending across the forehead; face, throat, fore neck, and all beneath, with the sides of the rump, white; beneath the eye and the ear-coverts brownish, striped on the upper part of the cheeks in most with white; sides of the chest brownish grey in some.

Summer plumage (Valley of the Yenesay, lat. 71½°, August 8, 1877). *Females.* Wing 3·7 to 3·75 inches; tail 1·7; tarsus 0·8 to 0·9; middle toe and claw 0·78 to 0·8; bill to gape 0·75 to 0·78.

(Petchora, July 22, 1875.) Wing 3·8 inches; tarsus 0·8; middle toe and claw 0·71.

(Yenesay). Top of the head, back, scapulars, and tertials black, the feathers edged with rufous-tawny; hind neck and sides of head yellowish tawny; feathers of the crown clearly edged with rufous-tawny, the black not extending down to the bill, above which, on the forehead, the feathers are dusky; face and ear-coverts tawny, streaked with dusky grey, which forms a sort of streak through the lores; on the hind neck the dark centres are narrow, the tawny colour predominating; rufous margins of the scapulars broader than on the upper back; lower back and rump uniform blackish brown; upper tail-coverts and central tail-feathers edged with rufous of the same hue as the tertials; some of the greater wing-coverts margined with rufescent; remaining tail-feathers pale brownish as in winter, the two outer pairs whitish beneath; throat white, *tinged* with rufescent, the centres of the fore-neck feathers with dark terminal spots; from the chest to the vent white, slightly tinged with buff.

This example is in richer plumage than the others, which have the tawny of the hind neck and sides of a paler hue; the throat almost white, with the fore-neck spots more clearly defined and the feathers not so uniformly tinged with rufous. The characteristic of the Petchora specimen is its more uniformly black head and back. This dress, which is mostly assumed by change of colour in the feathers, is commenced as early as March in Ceylon, the scapulars and tertials being the first to change.

Obs. The summer plumage of this Stint, the first time that it is assumed (and the same rule must apply to other members of the genus), differs from that of succeeding years in having the wing-coverts edged with rufous. This is in reality an immature characteristic, the feathers, up to the time being, not having been moulted; and they become slightly intensified in colour, together with the back and scapulars, having been throughout the winter edged with rufescent. After the moult succeeding the first breeding-season the wing-coverts assume their adult grey colour, and never change afterwards.

Young, nestling (Dvoinik). Back and wings ferruginous buff, mottled coarsely with black; forehead, face, and hind neck buff, a dark stripe through the lores; crown black, mottled with whitish buff: ear-coverts tipped with black, and a spot above them; under surface whitish, with a buff wash across the throat; thighs buff, mottled with black. Bill at front 0·39 inch; tarsus 0·73; middle toe and claw 0·74.

Immature (Heligoland, September). Wing 3·8 inches. Head blackish, the edges of the feathers buff; a white eyebrow passing to above the ears; hind neck brown, the feathers edged with greyish and with buff on the sides of the lower part; interscapular region black, some of the feathers edged with white, others with buff: scapulars blackish, with white tips and edges; wing-coverts and tertials edged with rufous-buff; quills as in the adult, but with the shorter primaries edged at the base with white; central tail-feathers edged with dusky fulvous; beneath white, tinged on the chest and breast with buff.

Obs. As found in Ceylon in its *winter plumage*, the *short toes and dark legs* distinguish this species at once from the next; but its lighter upper surface, white forehead, and unmarked chest enable it equally well to be discriminated from the Long-toed Stint at a momentary glance.

The eastern form of this Stint is the *T. albescens* of Temm., to which the prior name of *T. ruficollis*, Pallas, undoubtedly, I think, applies. It is a larger bird, having a longer wing and a proportionately larger tarsus and foot. One specimen in the Swinhoe collection measures 3·9 inches in the wing, seven 4·0, and four range between 4·1 and 4·35. It is almost indistinguishable from *T. minuta* in its winter plumage, but will, I think, always be found to have a pure white chest and a greater extent of white on the forehead, as well as a greyer upper surface. In summer livery, however, it has the face, neck, and chest fine rufous, the chin whitish, and the breast-feathers with dark central spots; the feathers of the head and back are black, edged with rufous, which predominates on the hind neck; the outer tail-feathers are pale brown; and the 2nd quill-shaft varies (it is generally white on the terminal half, but in some specimens it is whity brown). I was disposed at one time (Str. Feath. 1876, p. 205) to think that this species visited Ceylon; but in re-examining my specimens I find that they are not large enough and white enough on the chest to be safely included in its ranks.

In connexion with this species it will be well to mention that the middle figure in pl. 332, 'B. of Europe,' of *Tringa minuta* is *Tringa albescens*=*T. ruficollis* in summer plumage. Gould's description of *T. albescens*, Temm. (Birds of Austr. vi. pl. 31), refers to an example in partial change only; it reads, "sides of the breast spotted with dark brown and stained with rusty red in the centre." It is possible, however, that after all there may be two species of rufous-chested Stints, and that Gould's may be a local southern form of *T. ruficollis*, for he affirms that this bird was found breeding off the west coast of Australia.

T. minutilla, Vieill., the American representative of *T. minuta*, is smaller than it, measuring in the wing 3·3 to 3·6, and has the chest in summer plumage thickly spotted with brown and tinged with ashy fulvous; the chin is whitish, and it is altogether a darker bird.

Distribution.—The Little Stint is the most abundant by far of its genus in Ceylon. It is found all round the north coast from Negombo to Jaffna, and thence down to Hambantota; and within these limits is almost universally distributed wherever the locality is suited to its habits, being met with in very large flocks, far outnumbering its congeners noticed in the last and next articles. It is unusual to find it far inland; but it may be met with some miles from the sea-coast about small tanks, water-holes, and other fresh waters, and, of course, follows up salt lagoons to their source. I met with it at the Kanthelai tank. It is numerous on the extensive sands of the Jaffna lake, and on the immense flats above Elephant Pass it was the only small shore-bird besides the Kentish Plover that I saw there; it was very common on the Pootoor lagoons in the Jaffna peninsula, at which the next species was also pretty plentiful. I never met with it on the shore south of Negombo, for there are few spots between there and Matara suited to its habits; but it probably affects the mouths of the rivers on that stretch of coast. The Hambantota district is the only one in which I saw it during the S.W. monsoon; but the number of barren birds there were not equal to those of the Curlew Stint.

It is very abundant in India, being especially numerous near the sea-coast, but frequenting also the borders of large rivers and tanks. Mr. Hume records it from "various parts of Sindh, the Punjab, the North-west Provinces, Sindh, the Central Provinces as far as Raipur, and Bengal as far east as Dacca." In 1874, Mr. Ball, writing on the birds of Chota Nagpur, says it is the only species of Stint he obtained in that province; but apparently, in his list published in 'Stray Feathers,' vol. vii., the next species is substituted for it; and Mr. Hume inserts it on his own authority from Raipur only. In the Deccan, however, which is a more inland district, Messrs. Davidson and Wender say that it is very common in the cold weather. Captain Butler records it only from Deesa in the Guzerat province; but Mr. Adam asserts it to be very numerous at the Sambhur Lake in Jodhpore, remaining there until May, on the 25th of which month he has obtained it in full summer plumage. Non-breeding birds are stated by Captain Butler to be found at Kurrachee in the hot season; and this is not to be wondered at when the same thing occurs in Ceylon. On the eastern side of the bay it is chiefly a sea-coast bird. Dr. Armstrong found it extremely abundant all along the sea-shore between Elephant Point and China Bakeer; but it is not recorded from Upper Pegu. In Tenasserim it is rare and only found on the coast. In the Andamans it is not uncommon, and has been obtained there, as in Ceylon, in winter plumage during the month of June. In the Nicobars it was met with occasionally.

Dr. Stoliczka observed it about swamps at Yarkand and Kashgar during the first half of the winter; but it seems to have been passed over by Dr. Scully. In Turkestan proper it is found on passage in the northern and south-eastern districts, and is met with up to 4000 feet above the sea. It occurs, of course, on the Caspian; and in Palestine Canon Tristram obtained it in winter. Mr. Seebohm found it breeding in the Yenesay valley, but did not see it south of lat. $71\frac{1}{2}°$. Dr. Finsch likewise met with it on the Podarata river, N.W. Siberia. Von Middendorff found it common in the extreme north of Siberia on the Taimyr river, and likewise in the south-east of that country. As high up as lat. 74° he observed it on the 17th of June. Von Schrenck procured it on the Amoor and the Schilka, and he says that it is commoner in that region than *T. temmincki*.

In the breeding-season it is spread over Northern Europe, having been procured and noticed on the White Sea, the Petchora (where Messrs. Seebohm and Harvie Brown took its eggs), in Finland, Lapland, and Northern Scandinavia, and even in Nova Zembla and Waigats Island, where Von Heuglin met with it, in the latter place, as late as September. In Great Britain and Central Europe it is a bird of passage in spring and autumn, but it appears to be more commonly met with in the latter season than the former; this is the case both in England and Eastern Europe. In Sardinia it remains throughout the winter; but in Southern Spain it is chiefly a bird of passage. Col. Irby found it in Andalucia, consorting with Dunlins and Ring-Dotterels; and in Morocco he met with vast flocks of it. Mr. Tyrwhitt Drake likewise observed it in the latter country. In Egypt, it is, writes Captain Shelley, extremely abundant, frequenting both marshy grounds and sand banks. In the Sinai district Mr. Claude Wyatt procured it. Von Heuglin found it along the Nile and its tributaries, on the shores of the Red Sea, in the Gulf of Aden, and in the marshes of East Kordofan in autumn, winter, and spring; he met with it near Suez in breeding-plumage in May; but all throughout North-eastern Africa he says it is not so abundant as Temminck's Stint. Mr. E. Newton found it common in the island of Mahé in the Seychelles; but I do not know that it has been seen in Madagascar. In South Africa it is common in winter. Captain Shelley found it in flocks in Cape colony; and in Natal and the Transvaal Mr. Ayres also procured it, and saw it in numbers in some localities; at Potchefstroom he obtained a specimen as late as the 10th April, which was commencing to assume the breeding-dress. Layard writes that it is common in all marshes and on the sea-board in Cape colony.

Mr. Andersson records it from Damara Land; and it has also been obtained in Benguela, on the Gold Coast, in Sierra Leone, and at other places on the west coast. At Cape-Coast Castle Captain Shelley found it plentiful in spring.

Habits.—This Stint associates in larger flocks than other species in Ceylon, and is in this respect, as well as in its general habits, very like the Dunlin. When feeding on the ooze or at the edge of the tide, in the salt lakes and lagoons which it frequents, it does not "pack" closely together, but remains in scattered company, so that a flock of fifty or more covers a good extent of ground. When alarmed, the whole rise at once and glance off with arrow-like speed, coming together on the wing, and then, perhaps, making a sharp

turn, they will all fly back *en masse*, but drawn out in a "string," which swerves on its headlong course, and shows the white of the under surface and then the brown of the back of the birds alternately to the spectator. I have always found it shier than the Long-toed Stint; it does not readily admit of a near approach, but will generally rise at a long gun-shot: when roused from a good feeding-spot it is loathe to alight elsewhere; and I have known a large flock split up into small parties on being put up, which flew round and round, and, as I passed on, reunited and settled down where they had been flushed from. They are seldom found on marshy ground in Ceylon, but restrict themselves almost entirely to the mud and ooze, feeding along the edge of the water when the tide is in. They associate with the Long-toed Stint, and sometimes with the Kentish and the Mongolian Shore-Plovers. Their note is shrill, but not loud, and consists of two syllables, which they utter constantly on the wing or when rising; their diet consists of minute shells and insects.

Nidification.—The present species breeds in the extreme north of Siberia and Europe. Von Middendorff found its nest on the 1st of July in the Taimyr country; and in the beginning of August Dr. Finsch took its eggs on the Podarata river near the Bay of Kara. It is, however, from the interesting paper of Messrs. Seebohm and Harvie Brown on the birds of the Lower Petchora that we learn most about its nidification and its interesting habits while breeding. These naturalists found a number of nests on the shores of, and on the islands in, the "Inland Sea," an inlet of the Petchora Gulf, in lat. 68½°. A long account is given of these Little-Stint discoveries, with a minute description of the geographical features of this singular region, the nature of the locality, and the ground on which the nests were found; and, notwithstanding that my space will ill admit of it, I am compelled to subjoin some interesting extracts illustrative of the breeding-home of this species:—"The inland sea is shut off from the Petchora Gulf, to the north of the Boluanskai Bucht, except at their point of junction, by a peninsula, the seaward side of which consists of a range of sand hills covered with esparto-grass, lowering towards its extremity to a gravelly sandy ridge, which latter, sweeping inland in a circle, comes to a sharp point, and forms a promontory on the shore of the inland sea. Inside the sand hills there is a level green meadow studded over with many small pools, and intersected by narrow winding lanes of brackish and stagnant water. Many of these pools are of curious shapes, having almost an artificial appearance, their edges, about a foot in height, being perpendicular and even, as if cut by a spade. At the bottom, below a foot or two of water, is a deep, tenacious, bluish-black mud, which, if disturbed, gives off a powerful and offensive smell. Quantities of water-plants grow on the surfaces of some of them, sometimes almost choking them up. It is upon the edges of the pools, and on the shores of the inland sea adjoining, that the flocks of wading birds are found at feeding-time. . . . . .

"The inland sea is a large sheet of water connected with the Petchora Gulf by a narrow channel between the two low sand capes of Dvoinik, and is about 2½ versts across in any direction. It is surrounded by a strip of grassy meadow-land on a gentle slope above high-tide mark, which is from 40 to 100 yards in width, except, as already mentioned, on the seaward side, where it is replaced by the level meadow with a different and coarser vegetation. The whole stretch of this sloping meadow is covered with yellow grasses and carices; and here and there over its surface are diminutive plants of dwarf-willow (*Salix glauca*), considerable quantities of wild leeks, and isolated patches of a species of *Sphagnum*. Surrounding this, again, is the tundra, which, in some places, rises abruptly in a great wall 6 or 8 feet high, and in others slopes gently till it meets the meadow. At the latter points the vegetation of the tundra proper is found to blend with that of the meadow. A ridge of bleached and weather-worn drift wood of all sizes—branches, huge trunks, and roots—lies piled up close to the margin of the tundra; and small pieces are strewn over the surface of the meadow. The high-tide mark at the lower edge of the meadow is, in most places, sharply defined, an abrupt bank, a foot or two in height, having been formed by the action of the water. At low tide about forty yards of the black ooze is exposed; and upon this, as already noted, flocks of Dunlins, Stints, and other Waders are usually seen at feeding-time.

"The river Dvoinik runs into the inlet close to the sea, flowing from a southerly and easterly direction. It is a muddy still stream, with oozy bottom; and the tide ascends its tortuous course for several versts. The tundra on either side dips sharply down, forming steep banks on the upper reaches; but these give place, near its confluence with the sea, to low perpendicular banks cut through level meadow-land similar to what has already been described. . . . . .

"It was upon the sloping tundra, and upon the sloping meadow, that we found all our nests of eggs and young in down of the Little Stint. . . . . . This part of the tundra bears a thick growth of arctic bramble (*Rubus arcticus*), which, in some places, scarcely leaves a square yard free of vegetation. The dwarf rhododendron (*Ledum palustre*) is also abundant, but is small and inconspicuous. Large quantities of deep, soft, faded *Sphagnum* cover also a considerable part of the ground; and growing through this are *Carices* (*Carex rariflora* and another) and grasses, and a green star-shaped moss, the latter being the same which is often found on the ground frequented by the Grey Plovers. Reindeer-moss is scarce upon this Little-Stint ground, growing only in patches here and there; but the innumerable small round hummocks, with which parts of it are thickly covered, bear a thin crust of minute white lichen, which, blending with the darker colour of the peat soil upon which it grows, gives a hoary appearance to the higher portions of the slope."

The nests were little depressions made in the ground or with soft yellow *Sphagnum*, of which the turf in some places consists to the depth of 4 inches; some were rather rough and untidy round the edge, and only sparingly lined with small leaves, which might "have been plucked by the bird as she sat on her nest." The nests made in *Sphagnum* had the appearance of being formed by the pressing-down of the moss by the bird's body; those which were in turf not consisting of *Sphagnum* were lined "with more leaves—dried dwarf willow (*Salix glauca*) and arctic bramble, either gathered by the bird herself or drifted into them by the wind." Another nest was in loose sandy soil, the little excavation being lined with dried willow-leaves and bits of carex. The eggs were in all cases four in number, miniature Dunlin's in character, the ground-colour varying from greenish white to dusky olive-grey, and most of them richly blotched at the larger end with rich reddish brown, the darker eggs being similarly marked all over, and in one specimen the markings run into one another so as to form very handsome irregularly-edged clouds. They are pyriform in shape, some being more compressed at the small end than others, and vary from 1·13 to 1·15 inch in length by from 0·8 to 0·84 in breadth. The old birds exhibited a most charming ignorance of danger (which unfortunately, in the interests of science, had to be taken advantage of), having the habit, in common with most Waders, of feigning lameness or a broken wing, and trailing themselves along the ground to entice the intruder from their nests; but when he was accompanied by a dog they showed much more timidity. The following extract from Mr. Harvie Brown's journal, published in the article in question, is illustrative of the nature of these interesting little birds:—

"As I came nearer I saw a small bird flying in circles round him (Piottuch) and Simeon, and alighting now and again close to them. Seeing this I ran forward, and Piottuch held out two young Little Stints, not more than a day, or at most two days out of the shell. I sat down; and ere many seconds elapsed the old bird alighted within a yard or two of our feet, uttering a very small, anxious, whistling note. My gun lay on the ground beside me, within reach of my hand; and I put down one of the young about six inches beyond it. Almost immediately the old bird advanced close up to it, and, uttering its low notes, endeavoured to lead it away. Piottuch then held out the other young one in his left hand, and it uttered a scarcely audible cheep. The old bird advanced fearlessly to within twelve inches of his hand; and he nearly caught it. I then shouted to Seebohm to come, being at the same time prepared to shoot the bird if it flew away to any distance; but no, it only flew about ten or fifteen yards, and then began to sham lameness, tumbling about amongst the little hummocks and hollows, and never going further from us than about thirty paces. Seebohm now came up, and took his seat beside us. The old bird became a little shier, but still flew round us in circles, alighting, as before, from time to time."

On the Yenesay Mr. Seebohm had eggs brought to him in lat. 71½° by a Samoyede, which were taken in the middle of July.

TRINGA SUBMINUTA.

(THE LONG-TOED STINT.)

? *Totanus damacensis*, Horsf. Trans. Linn. Soc. xiii. p. 192 (1821).

Tringa subminuta, Midd. Sib. Reise, p. 222, t. xix. fig. 6 (1853); Schrenck, Reisen u. Forsch. Amur-L. i. p. 424 (1860); Jerdon, B. of Ind. iii. p. 691 (1864); Legge, Ibis, 1875, p. 402.

Tringa salina, Pallas, *apud* Sharpe & Dresser, B. of Eur. pt. 7, "*Tringa minuta*," p. 5 (1871); Holdsw. P. Z. S. 1872 (first record from Ceylon), p. 474; Legge, Str. Feath. 1873, p. 491.

Tringa ruficollis, Pallas, *apud* Walden, Trans. Zool. Soc. 1875, ix. p. 234; Hume, Str. Feath. 1878 (B. of Tenass.), p. 461; Ball, ibid. vii. 1878, p. 228; Hume, ibid. 1879, viii. p. 113 (List Ind. Birds).

Tringa damacensis (Horsf.), Swinh. Ibis, 1863, p. 413; Schlegel, Mus. P.-B. *Scolopaces*, p. 48 (1864); Blyth, Ibis, 1867, p. 168; Swinhoe, P. Z. S. 1871, p. 409; Hume, Str. Feath. 1873, p. 242; Oates & Hume, ibid. 1875, p. 182; Blakiston & Pryer, Ibis, 1878, p. 221; Seebohm, Ibis, 1879, p. 226.

Actodromas salina (Pall.), Salvadori, Ucc. di Born. p. 324 (1874).

Tringa minuta (lapsus calami*), Legge, Ibis, 1874, p. 29.

Pallas's Stint of some; *Sandpiper*, *Sand-Lark*, Europeans. *Kotan*, Tamil.

Olawatuwa, Sinhalese.

Adult male and female (Ceylon). Length 6·0 to 6·25 inches; wing 3·65 to 3·8; tail 1·5; tarsus 0·8 to 0·9; *middle toe and claw* 0·9 to 1·0; bill to gape 0·72 to 0·81.

Iris brown; bill blackish yellowish or yellowish green at base beneath; legs and feet yellowish olivaceous, the joints plumbeous and the toes slightly greenish.

Winter plumage (Ceylon). Head, hind neck, back, scapulars, and tertials deep sepia-brown, darkening into black on the rump and upper tail-coverts, and edged, except on these latter parts, very broadly with brownish ashy; wing-coverts of a slightly paler brown, with the edgings greyish white; quills and centre tail-feathers blackish brown, paling on each successive tail-feather to the outermost, which is very light brown; secondaries and their coverts, and all but the centre tail-feathers, tipped with white; the 1st primary with a *sullied white* shaft, the *remainder brown*; lores, cheeks, sides of neck, and the chest striated with brown; the ear-coverts almost uniform; in front of the eye a darkish spot, above the lores a white streak (not extending to the point of the forehead); chin, throat, and under surface, with the sides of the lower back and rump, white, with either a greyish or greyish-brown wash over the striated part of the chest and the upper flanks; under wing-coverts white, the lesser rows with dark bases.

Summer plumage (Amoor Land, Dr. Maack). *Female*. Wing 3·72 inches; tail 1·4; tarsus 0·87; middle toe and claw 0·95; bill at front 0·76.

Head, back, scapulars, rump, and centre tail-feathers brown-black, the rump and tail-coverts uniform, the rest margined with rufous; the centre tail-feathers edged with rufous-buff; the hind-neck feathers broadly margined with buff; tertials edged with buff and rufous; least wing-coverts uniform brown, the greater edged with rufescent buff; quills as in winter; the black of the forehead comes down to the bill; lores, above the eye, and the face whitish, streaked with brown, particularly on the ear-coverts; chin and gorge unspotted white; a buff wash across the centre of the throat, and the feathers with dark shaft-lines; rest of the under surface white; a few spots of brown on the lower flanks.

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* Correctly spoken of as *T. salina* in Str. Feath. 1873, p. 491, the Stint of the Galle district.

A series of six skins in summer plumage, from China, correspond with the Amoor example in having no rufous on the chest; their plumage is of precisely the same character, but varies in individuals as regards the intensity of the upper-surface colouring, and in the amount of striation on the chest and *sides* of the neck. The length of the middle toe and claw varies from 0·93 to 0·97 inch in these.

Young. I have not been able to examine either a nestling or young bird in first plumage of this species, and I am not aware that the former has ever been procured.

Obs. As this Stint does not assume a rufous chest or throat in summer, Pallas's name *ruficollis* (Reis. Russ. Reichs, iii. p. 700, 1776) cannot apply to it. He described, I am convinced, a specimen of the eastern form, hitherto styled *T. albescens**, in breeding-plumage, "*subtus collum totum ad pectus usque intense ferrugineum*" being his expression. Pallas described many years afterwards (Zoogr. ii. p. 199, pl. 61, 1811–31, ex Pallas) a Stint as *T. salina*, which he identifies with *T. ruficollis*; and he says of it:—"Jugulum ferrugineo-nebulosum album, punctis fuscis in masculo crebrioribus." Pallas may have either rightly or wrongly identified the second bird with the first; and this description might perhaps be held to apply to the Long-toed Stint as much as to an example of the rufous-chested one in partial plumage. The main point is that no mention of the toes is made; and I therefore maintain that the term *salina* should not be considered to apply to the Long-toed Stint. Middendorff, however, is particular to speak of the length of the middle toe, and even gives a drawing of it, which measures the same as that of a Ceylon specimen.

Horsfield's *Totanus damacensis* does not seem to me to be sufficiently well characterized to indicate the present species. It is as follows:—"*T.* supra pallide cinereo-fuscus, subtus albus, remigibus fuscis, rachidibus primorum albis aliarum fuscescentibus. Long. 6½ poll." "*Supra pallide cinereo-fuscus*" applies more to the upper surface of *T. temmincki* or even *T. albescens* than to the dark-centred light-edged feathers characteristic of the present bird. "*Subtus albus*": no mention is made here of the darkish chest; and this applies more to *T. ruficollis* in winter plumage. "*Remigibus fuscis, rachidibus primorum albis aliarum fuscescentibus*," applies to the present species, but so also to the next, *T. temmincki*. Finally, the length is too great for any of these small Stints, except perhaps *T. ruficollis*. As further proof that Horsfield was not very clear as to the species he was describing, I may remark that there are two specimens in the India Museum labelled in his own handwriting *Totanus damacensis*, one of which is the large form of *T. minuta*, and the other the present species in moult, with the 1st primary undeveloped. I prefer, therefore, to adopt Middendorff's name, so concise is he in describing the species and alluding to the long toes.

Distribution.—This species is, from all accounts, less common in India than in Ceylon. It is plentiful all round the north coast of the island, in the Trincomalie district, and about the salt lakes of the Yāla and Hambantota country. I likewise found it in newly-ploughed paddy-fields in pairs or in small troops of three to six, with *T. glareola*, in the Galle district, in the month of January; and it was the only species of Stint which I noticed on that part of the island, as I never met with it on the west coast south of Madampe. A noteworthy capture of an individual is that by Mr. Bligh, who procured it in May 1876 at the foot of the Catton valley, at an elevation of 2000 feet. This bird was evidently on passage to the north, and was making its way from the Hambantota district across the Central Province. In the north, where it is common, it is not so plentiful as *T. minuta*, as this latter species musters there in great numbers; and at Aripu I observe that Mr. Holdsworth only procured two specimens, which were the first recorded from the island. Layard seems to have passed it over, or else did not distinguish it from the Little Stint, for where he collected largely, in the Jaffna peninsula, it is tolerably common. I met with examples of it at Hambantota in July, but they showed no signs of summer plumage.

Until quite recently this Stint was not noticed in India. Jerdon calls attention to it as an allied species to the next, and merely mentions that it is found in the more eastern parts of India and Burmah. Writing in 1873, Mr. Hume remarks that he has never seen it in continental India; but two years later he records it from Pegu, and publishes Mr. Oates's remark that it "is very common during the cold weather on sand

* The synonymy of this Stint, referred to in the previous article, I conceive to be as follows:—
Tringa ruficollis, Pallas, Reis. Russ. Reichs, iii. p. 700, "Dauria" (1776).
Tringa salina, Pall. Zoogr. Rosso-As. ii. p. 199, pl. 61 (1811–31).
Tringa albescens, Temm. Pl. Col. 41. fig. 2 (1824).
? *Schœniclus australis*, Gould, B. of Austr. vi. pl. 31 (1848).

banks and edges of ponds, and in flocks of from ten to thirty." About Calcutta in the cold season it is to be found in equal numbers with the Little Stint. Mr. Ball records it from Sambalpur and Lohardugga, which are the only two localities as yet published in which it has occurred. As a matter of necessity, however, it must be, to a certain extent, located along the east coast of the peninsula, by which route it travels south to Ceylon. It is unknown in the north-west of the empire, and we have no record of its occurrence on the west coast. As it is a bird of eastern distribution, it is, no doubt, more common on the eastern side of the Bay of Bengal, and will, when that region has been more thoroughly examined, be found along the coast of Tenasserim and the Malay peninsula. At present it has only been obtained at Tonghoo by Capt. Ramsay, and at Thatone and Yea, in Tenasserim, by Mr. Davison. Further south it has been procured at Malacca; and in Java it was obtained by Kuhl, Van Hasselt, and Horsfield. Its range extends to Borneo, where Schwaner obtained it, and thence to Celebes, beyond which island it has not as yet been met with.

Its summer quarters are North-eastern Siberia and Amoor Land, from which region it was described by Middendorff. It does not, however, appear to be abundant in such places which have been visited, and its true breeding-home has evidently not been discovered. Von Middendorff met with only two examples in all his travels; one was procured on the western slopes of the Stanowoi Mountains, and the other at the mouth of the Uda; both were shot in the summer, and they form the types of his *T. subminuta.* Schrenck likewise procured one pair only on the Amoor river, near the mouth of the Ssungari tributary, on the 19th of July. Prjevalsky says that it inhabits the whole of South-east Mongolia, with the exception of the Ala-shan; but he did not see it at all in Kan-su and about Koko-nor. Mr. Blakiston procured it in Kamtchatka and also in Yezo. Swinhoe obtained it on the China coast and in Formosa, and remarks that it passes down early and returns late. It extends eastwards to the Philippines, where Dr. Meyer procured a specimen in Luzon in February, which is noticed by Lord Tweeddale in his list of Philippine birds.

Habits.—This pretty little Stint, though affecting the vicinity of the sea-shore, is more of a marsh-bird than other members of its genus in Ceylon. Its favourite resort in the Trincomalie district was the salt marshes bordering the ooze surrounding the lagoons; these are covered for about an hour before and after the flood, and are overgrown with rank grass and intersected with little pools and watercourses leading to the muddy foreshore. I frequently met with the Long-toed Stint at these spots in company with *Totanus stagnatilis* and *T. glareola,* three or four individuals being the usual number mixed up with half a dozen of these Sandpipers. When feeding at the edge of the ooze, or upon it, it generally consorted with its more numerous relative the Little Stint. At times I have seen it in small parties of six or a dozen feeding in "extended order" in long grass, which concealed them from my approach, and I then flushed them close to my feet, like so many Snipe. In the summer season, when they were seen in the Hambantota district, they were on the shores of the leways, associating with Curlew Stints and *T. minuta.* When I met with them in the paddy-fields in the south of Ceylon they were fonnd mixing with Wood-Sandpipers and feeding on the newly upturned mud; and the stomachs of those I shot contained small insects and animalculæ. Elsewhere I have seen it round isolated pools or paddy-fields near the sea, and have noticed it consorting with the Ringed Plover (*Ægialitis curonica*). Its note is a weak trilling whistle, resembling in tone that of most Stints, and not unlike that of the Dunlin, but much weaker of course; it is not so loud as that of *T. minuta.* Its flight is very swift, and when a little flock are proceeding at a great pace in close company they turn and twist, alternately showing the upper and lower plumage in the same manner as the Little Stint. The stomachs of all the specimens examined contained a large quantity of gravel mixed with the diet partaken of, which consists chiefly of small aquatic insects and also flies which they pick off the grass.

I know nothing of its nidification and am not aware that its eggs have ever been found.

In 'The Ibis,' 1864, p. 420, Swinhoe mentions having seen what he considered to be an example of *T. albescens* in the Museum of the Asiatic Society at Colombo. In this collection, however, there were, at that time, birds from other localities than Ceylon; and therefore the presence of a specimen in it was not a certain guarantee that its habitat was Ceylon.

TRINGA TEMMINCKI.

(TEMMINCK'S STINT.)

Tringa pusilla, Lath. Ind. Orn. ii. p. 737 (1790, *nec* Linn.).

Tringa temminckii, Leisler, Nacht. zu Bechst. Naturg. Deutschl. ii. p. 75 (1811); Gould, B. of Eur. iv. pl. 333 (1837); Blyth, Cat. B. Mus. A. S. B. p. 270 (1849); Von Middendorff, Sibir. Reise, ii. p. 221 (1853); Schrenck, Reisen u. Forsch. Amur-L. p. 422 (1860); Schlegel, Mus. P.-B. *Scolopaces*, p. 47 (1864); Jerdon, B. of Ind. iii. p. 691 (1864); Swinhoe, P. Z. S. 1871, p. 409; Sharpe & Dresser, B. of Europe, pt. 7 (1871); Shelley, B. of Egypt, p. 252 (1872); Hume, Str. Feath. 1873, p. 244; Legge, *t. c.* p. 491 (first record from Ceylon); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1192 (1874); Irby, B. of Gibraltar, p. 173 (1875); Legge, Ibis, 1875, p. 412; Hume, Str. Feath. 1875, p. 183; Butler & Hume, ibid. 1876, p. 17; Fairbank, *t. c.* p. 263; Seebohm & Harvie Brown, Ibis, 1876, p. 308; Hume, Str. Feath. 1878 (B. of Tenass.), p. 161; Ball, ibid. 1878, vii. p. 228; Hume, ibid. 1879, viii. (List B. of Ind.), p. 113; Seebohm, Ibis, 1879, p. 149; David & Oustalet, Ois. de la Chine, p. 473 (1877).

Pelidna temminckii (Leisl.), Boie, Isis, 1876, p. 979.

Leimoneites temminckii (Leisl.), Kaup, Natürl. Syst. p. 37 (1829).

Actodromas temminckii (Leisl.), Salvadori, Uccelli di Born. p. 324 (1874); Cripps, Str. Feath. 1879, p. 303.

White-tailed Stint, White-tailed Sandpiper of English writers; *Bécasseau Temminck*, French; *Temminck's Strandläufer*, German; *kleniste Strandlooper*, Dutch.

Adult male and female (Petchora valley: coll. Seebohm). Wing 3·75 to 3·8 inches; tail 1·8 to 2·0; tarsus 0·65 to 0·68; middle toe and claw 0·7; bill to gape 0·6 to 0·62.

Adult female (Ceylon, November). Length 6·1 inches; wing 3·95; tail 2·1; tarsus 0·7; middle toe and claw 0·75; bill to gape 0·65, at front 0·71.

The gape is more advanced in this species than the other small members of the genus (*T. minuta*, *T. subminuta*, &c.).

Iris brown; bill black, lightish at the base of under mandible; legs and feet olivaceous greenish, joints dusky plumbeous.

Head and above *almost uniform* cinereous brown, darkening to blackish brown on the rump and centre of upper tail-coverts, and with the wing-coverts pale-edged; wings and tail dark brown, the secondaries and their coverts and inner primaries tipped white, the first quill-shaft *white*, the remainder *brown*; *two outer tail-feathers* pure white, and the adjacent paler brown than the centre pair; lores and face brown; a light streak in front and above the eye; chin, gorge, and under surface, with the sides of the rump and upper tail-coverts, white; chest and lower fore neck pale brownish, the feathers light-tipped, the whole forming a broad pectoral band.

Summer plumage. Adult male (lower Petchora valley, June). Above brown, the feathers of the head and back blackish, with greyish-buff and fulvous edgings; these are most conspicuous on the scapulars, where the black coloration is confined to the terminal portion of the feather; lower back and rump blackish brown, the feathers with indistinct pale tips; wings dark brown; the primary-coverts blackish brown; the secondaries narrowly tipped with white, and the primaries with the first shaft white and the remainder brownish; longer tertials with buff margins; outer tail-feathers blackish brown, the next two paler brown, and the remainder white, the third feather from the side being sullied; a dark line through the lores and the forehead scarcely paler than the crown; chin and throat white; fore neck and chest almost uniform brown, the feathers on the upper part with pale fulvous edgings; breast, lower parts, and under tail-coverts white; under wing brown, edged pale along the edge; axillaries white; legs olive-yellowish.

A female (same locality, May) is in similar plumage, the fulvous edgings of the upper surface somewhat lighter, and the chest not brown.

Young nestling (Warsilkova, Petchora, July). Ground-colour of upper surface buff-grey; crown and nape black, mottled with pale buff, the dark colour descending in a stripe to the base of the bill, on each side of which a light stripe runs back into the black of the crown; a fine dark line through the lores; back and wings marked with black, mottled with pale buff; under surface whitish; lower part of fore neck and across the throat buff. Bill at front 0·32 inch; tarsus 0·52; middle toe 0·52.

The dusky colour of the upper surface characterizes the nestling of this species.

Young in first autumn. Upper plumage brown, the feathers tipped with rufescent buff on the back and wing-coverts, the scapulars and tertials margined with the same; chest and breast tinged with buff.

Obs. I append some measurements of Indian specimens, as illustrative of the size of what may be presumed to be Asiatic-bred individuals, and which were taken from Furreedpore birds:—

Males. Length 6·0 to 6·25 inches; wing 3·28 to 3·62, expanse 11·25 to 11·50; tail 1·83 to 2·0; tarsus 0·6 to 0·66; bill from gape 0·66 to 0·68, at front 0·66 to 0·68. Weight 0·87 to 1·12 oz. (*Cripps.*)

Females. Length 6·10 to 6·3 inches; wing 3·66 to 3·83, expanse 11·5; tail 2·0 to 2·25; tarsus 0·66; bill from gape 0·66 to 0·7, at front 0·64 to 0·66. Weight 0·62 oz. (?).

The example from Ceylon above alluded to exceeds any of the above. For the better discrimination one from the other of the several small Stints inhabiting Ceylon, I subjoin a diagnosis of their respective characters in winter plumage:—

(*a*) *T. minuta.* Forehead and eye-stripe white; feathers of back pale-edged and light brown in the centre; first shaft white, remainder brown at the base and white near the tips; two outer tail-feathers pale brownish; chest very lightly streaked with brownish grey; *middle toe shorter than tarsus, not exceeding* 0·7 inch; legs blackish or blackish leaden.

(*b*) *T. subminuta.* Forehead brown; back-feathers very dark brown in the centre; first shaft white, remainder *all brown*; two outer tail-feathers pale brownish; chest with dark shaft-stripes to the feathers; *middle toe equal to the tarsus*, attaining 0·9 inch in length; legs olivaceous.

(*c*) *T. temmincki.* Centre of the forehead brown; almost uniform brown above; first quill-shaft white, remainder all brown; two outer tail-feathers *pure white*; chest brownish.

Distribution.—I procured the specimen above described on the Tamblegam flats, where I shot it out of a flock of Little Stints which were frequenting the mud in a small tidal creek a mile or so from the shore. I am unable to say whether there were more examples than one, for it fell, with two or three of the latter species, to a shot fired into the flock. I never met with an example afterwards; and it has never been otherwise recorded from the island. It is, however, doubtless a yearly straggler to Ceylon, and passes unnoticed while mixing with the thousands of Little Stints that one sees.

In India it is found both on the sea-coast and in the interior. The Rev. Dr. Fairbank is the only naturalist that has observed it in the Deccan, whence he records it as occurring at Ahmednagar. Mr. Ball notes it from Hazaribagh, Lohardugga, and Orissa, to the north of the Mahanadi river, as also from the Godaveri valley, while Mr. Hume records it from Raipur; the same author states that it is pretty common about Calcutta; and in Furreedpore it is "common in every pool of water and along the banks of rivers and creeks" (*Cripps*), being one of the earliest summer visitors in this part. It has been obtained once in Pegu by Mr. Oates; but in the Irrawaddy delta, where one would suppose it to be common, it was not noticed by Dr. Armstrong. Further south, in Tenasserim, writes Mr. Hume, "it is pretty common about inland creeks and pools in the central portion of the province, and again in the tracts west of the Sittang." In this direction it does not seem to extend further south, nor has it been seen in the Andamans, although it may have been passed over there as in Ceylon.

In the north-west of India it is found in small flocks about tanks between Deesa and Ahmedabad in Guzerat; and it was met with commonly in Sindh by Mr. Hume, who states that it is distributed through all the adjacent provinces. It remains in the north of India until May, when it may be shot in full summer plumage. Its earliest arrival in Guzerat is, according to Captain Butler, the 5th of August. In Turkestan Severtzoff

asserts that it is found on passage in the north and south-east, and that it *breeds in the mountains of the west and north-east of the country between an elevation of* 10,000 *and* 14,000 *feet.*

Col. Prjevalsky says that it is tolerably common in S.E. Mongolia during the spring migration; and in the summer in July he met with it in the Hoang-ho valley, where he considers it probably breeds. "In Gobi," he remarks, "a few migrating individuals were observed during the month of August; they kept most to the small rain-pools. It does not occur in Kan-su; nor did we find it in Koko-nor; but its absence in the latter place might be accounted for by our being there only late in autumn and early in spring." Père David likewise found it common in Mongolia on the borders of rivers and lakes, and observes that it occurs in numerous flocks through China, remaining in the southern provinces during the winter.

It wanders very far north to breed. Von Middendorff observed it in Taimyr Land, on the river of that name, in lat. 74° N.; and Mr. Seebohm met with it on the Yenesay. The first-named author states that it nests on the Boganida river, and also in the Stanowoi Mountains in Eastern Siberia. Mr. Seebohm remarks that at the mouth of the Yenesay and on the islands of the delta it was by far the commonest species of its genus. Finsch states ('Ibis,' 1877) that he observed it with young on the isthmus of the Yalmal Peninsula; but he since writes that the birds observed were *T. minuta.* Von Schrenck observed it on the Schilka as early as the 19th of May; and one specimen obtained was then in winter dress. It is found on the Japanese island of Yezo; and it occurs throughout the Chinese coast in winter. It is probably by way of the coast of China that it strays as far south as Borneo, where it was obtained at Pagattan by Schwaner.

Turning westward to Europe, we find it recorded from Turkey by Herr Finsch; and in the south of the continent generally it is found during the winter. Professor Von Nordmann, writes Mr. Dresser, believes it to breed in the Crimea. Its true summer haunts are, however, the north of Russia, Lapland, and Scandinavia, whither it resorts in great abundance to nest, as we learn from Messrs. Seebohm and Harvie Brown's experience on the Petchora, and likewise from the visit of the latter gentleman to Archangel. It is not so common in the west of Europe as the Little Stint, and is only a straggler to England, where it occurs chiefly in the autumn. Several examples have been obtained in the neighbourhood of Newcastle by Mr. Hancock, and among them one in summer plumage, shot on the 25th of May. It has once been found in Ireland, according to Mr. Dresser; but in Scotland it has not been noticed, although it ought to occur on the east coast *en route* to Norway. It is included in Mr. Smith's list of Portugal birds, although he did not observe it himself. Near Gibraltar it is common in winter, being, says Col. Irby, found in small parties of from six to a dozen or more. It has not been recorded from Morocco; but it no doubt occurs there, as it has been found down the west coast as far as Senegambia. It is met with in Algeria; and in Egypt and Nubia it is distributed throughout the country, but is not so abundant as the Little Stint. Von Heuglin states that it wanders south in winter as far as the Kordofan swamps and the White Nile, and is also to be found on the coast of the Red Sea, leaving for the north in April and May, although stragglers remain throughout the summer in that region.

Habits.—In its economy this pretty little Stint resembles the other members of the genus *Tringa*, and frequents the usual localities on the banks of tidal or large inland rivers, the margins of lagoons, salt marshes, and the sea-shore itself. Its flight is swift; and it has a singular habit of hovering in the air while breeding, which is not peculiar to any other of its congeners. Messrs. Alston and Harvie Brown speak of it as follows:—"It rises and hovers with raised wings about 15 feet from the ground, uttering at the same time a low trilling note. This habit was well known to our boatmen, one of whom, when he wished to indicate the species to us, would hold out his arms, vibrating the fingers, and imitating the cry of the bird to perfection." Col. Irby states that they are "tame and easy to obtain;" and this trait in their disposition is intensified during the breeding-season, for the charming fearlessness which they exhibit at this time has been the admiration of all who have visited their Arctic haunts. Mr. Dresser noticed, while observing them in Finland, that, in running about after insects, gnats, &c., on which they feed, "they moved with great activity, the head drawn rather close to the body; and when they rested for a moment they would, like many of their allies, move the head backwards and forwards several times. The note is shrill and cricket-like, but pleasant, and somewhat resembles the word *Tirrii* several times repeated."

Nidification.—In the north of Asia this species breeds on the Boganida, Yenesay, Ob, and Taimyr rivers,

on the lakes near the Arctic Ocean, on the islands in the river-deltas, and in the Stanowoi Mountains. Mr. Seebohm found a nest as early as the 24th of June on the Yenesay, and later on took its eggs on the islands of the delta in lat. $70\frac{1}{2}°$ and $71\frac{1}{2}°$. It is interesting to know (if Severtzoff is certain of the fact) that it breeds in the mountains of Turkestan; and should this be the case, it is just possible that *T. subarquata* breeds in Kashgar, as Dr. Scully was informed.

In Europe Mr. Dresser found it breeding in the Uleåborg Islands off Finland, and gives the following account of it:—"I spent the 12th of June on the islands outside of Uleåborg, looking for nests, and found one of this bird on Akkio Island. . . . . It was situated near the middle of the island, some twenty or more yards from the shore; and being placed where the grass was thick, it was not seen till almost trodden upon. It was a mere hollow in the earth, such as might be made by working the large end of a hen's egg in soft soil, with small hay-straws neatly arranged round the inside, and contained four eggs, all placed with the pointed end towards the centre. Both birds were very fearless, and did not go from the nest, but every now and then flew up in the air and descended again in circles, fluttering like a Skylark, uttering at the same time a peculiar churring sound, which they also emitted while sitting on any elevated place. A favourite perch of one of them was a pole which had been set up for a pilot's mark, but had been broken off about 8 feet from the ground; on this the bird would sit for a quarter of an hour at a time, churring all the time, and would allow me to approach within a few feet of it."

Mr. John Wolley, the celebrated oologist, in giving Mr. Hewitson an account of its nesting, which was published in the latter gentleman's 'British Birds' Eggs,' also speaks of this Stint's interesting habits while rearing its young. He says:—"Nothing can be more interesting or pretty than this little bird in the early part of summer; it is so tame that one could often catch it in a net at the end of a stick. At one time it is hovering with its wings raised over its back, or floating about, and it reminds one rather of some insect than any other bird; at another time it may be standing on the top of a stone or stake, or the gable end of a cottage; and whether hovering or standing on its perch, it utters a constant trilling note, of which I can best give an idea by saying that it brought to my recollection the Grasshopper Warbler, though the resemblance is perhaps slight. When its eggs are very near, it sometimes runs about one's feet, and, though it cannot but be anxious, it seems as busy as ever, picking gnats and other insects off the grass."

The eggs are four in number, and vary very much in ground-colour; a large series in Mr. Seebohm's museum now before me vary from greenish white to buff stone-colour, and also olive-grey, between which there are various shades of buff. The markings are usually rather small sharp-edged blots of deep brown, mixed with smaller specks of the same, chiefly gathered about the large end, but not confluent or in the form of a cap; and beneath them lie small spots of bluish grey. Some, however, have the large end tolerably covered with large blotches; but the markings on the rest of the egg, with one or two exceptions, are of the normal small size. In some of the buff eggs the blotches and spots are pale brownish red. The green eggs have the darkest colouring. As in other Waders, the markings take a diagonal direction round the middle of the egg. They are pyriform in shape, and range in dimensions between 1·15 and 1·04 inch in length, and 0·81 and 0·78 respectively in breadth.

Subgenus LIMICOLA.

Bill very high at the base, then suddenly flattened and depressed to the tip, which is bent down in both mandibles; gonys ridged; a fine groove adjacent to the edges of both mandibles; nostrils oval and oblique, placed in a depressed membrane. Otherwise as in *Tringa*; the hind toe a little longer.

LIMICOLA PLATYRHYNCHA.

(THE BROAD-BILLED STINT.)

Numenius pygmæus, Lath. Ind. Orn. p. 713 (1790, *nec* Linn.).

Tringa platyrhyncha, Temm. Man. d'Orn. ii. p. 616 (1820); Gould, B. of Eur. iv. pl. 331 (1837); Blyth, Cat. B. Mus. A. S. B. p. 269 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Jerdon, B. of Ind. iii. p. 692 (1864); Schlegel, Mus. P.-B. *Scolopaces*, p. 49 (1864); Holdsw. P. Z. S. 1872, p. 474; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1185 (1873); Hume, Str. Feath. 1873, p. 244, et 1874, p. 298; Armstrong, ibid. 1876, p. 343; David & Oustalet, Ois. de la Chine, p. 470 (1877).

Tringa pygmæa (Lath.), Von Middendorff, Sibir. Reise, ii. p. 223 (1853).

Limicola platyrhyncha (Temm.), Salvadori, Ucc. di Born. p. 222 (1874); Dresser, B. of Eur. pt. 51, 52 (1876); Hume, Str. Feath. (B. of Tenass.), 1878, p. 461; Hume, ibid. 1878, vii. p. 487; id. ibid. 1879, viii. (List of Ind. B.), p. 113.

? *Limicola sibirica*, Dresser, P. Z. S. 1876, p. 674.

Le plus petit des Courlis, Sonn.; *Pygmy Curlew*, Lath.; *The Broad-billed Sandpiper* of some.

Adult female (Ceylon, Feb. 21, 1879). Length (from skin) 6·4 inches; wing 4·2; tail 1·8; tarsus 0·85; hind toe and claw 0·78; bill to gape 1·28.

Note. The bill is flattened in this species, and bent down at 0·3 inch from the tip.

Adult male (Öland). Length (from skin) 6·5 inches; wing 4·3; tail 1·8; tarsus 0·8; middle toe and claw 0·8; bill to gape 1·2.

Iris brown; bill black, slightly pale at the base beneath; legs brown.

Winter plumage (Ceylon). Head, hind neck, and back grey-brown, the centres of the feathers darker than the edges; lower back, rump, and centre tail-feathers brownish black, with pale tips to the feathers; scapulars tipped with white, and with black shaft-streaks; least wing-coverts brown, finely edged with greyish; median and greater coverts blackish at the centre, then paling into grey, with deep margins of white; primaries and secondaries blackish brown, with whitish shafts; primary-coverts blackish; remaining tail-feathers greyish brown, the inner webs pale, that of the lateral feather almost white.

Lores dark grey, surmounted by a broad white stripe starting from the bill (where it confines the brown of the forehead into a point) and passing over the eye; cheeks and ear-coverts streaked finely with brown; beneath, from the chin to the under tail-coverts, white; under wing-coverts white; feathers beneath the metacarpal joint edged with brown; sides of the neck streaked with brown.

An example from China (24th November) has the superciliary bands less conspicuous, the face more streaked with brown, and likewise the chest slightly striated.

Summer plumage (Öland, 24th May).—*General character.* Head, back, and scapulars margined with dark rufous and white; top of head, occiput, lower hind neck, back, scapulars, and tertials deep black, most of the feathers edged with rufous, and the scapulars and interscapulars with broad lateral white margins; hind-neck feathers edged

with greyish, as in winter; lower back dull black; upper tail-coverts and four central tail-feathers deep black, tipped with rufous; feathers at the side of the rump and the lateral covert-feathers broadly margined with white; quills darker than in winter; lores and a broad stripe passing under the eye and over the ears black-brown; chin white; feathers of the face, fore neck, and its sides blackish grey in the centre, and broadly edged with white, the black centres set off above with rufous; beneath, from the chest, pure white, as in winter.

An example from Amoy (wing 4·45 inches) is more broadly edged with rufous than the above; but this colour is confined to the same parts.

Young, in down (Muonioniska). "A narrow stripe from the base of the upper mandible, widening towards the centre of the crown until it covers the whole hind crown, black tinged with chestnut, and on the hind crown spotted with white; upper parts generally black, minutely spotted with white, and marked with chestnut on the sides; sides of the head and fore crown and underparts white, tinged with buff on the throat; a black patch before the eye, below which a black line passes along the side of the head to the nape." (*Dresser.*)

Obs. The eastern form of this Stint inhabiting China differs slightly from the western and European bird in having more rufous on the upper surface, the edgings of the head- and back-feathers being broader and brighter than in typical *Limicola platyrhyncha.* Mr. Dresser has consequently separated it under the name of *L. sibirica* (P. Z. S. 1876, p. 674). I see but little difference in Chinese examples I have examined and the one above described, and I scarcely think the eastern form worthy of separation. The distribution of colour is the same, simply intensifying as the bird ranges to the eastward. In winter he says it cannot be separated easily from the European form, though it appears to him a trifle paler, and somewhat longer in the wing and tarsus. Mr. Hume's measurements of fifteen specimens from India and Burmah vary in the wing from 3·9 to 4·35 inches, and in the tarsus from 0·85 to 0·94. In this series, some of which might be supposed to belong to the eastern form, the length of tarsus does not always correspond with that of the wing; for example, there is a ♂ (Kurrachee), wing 3·9 inches, tarsus 0·85; ♂ (Andamans), wing 4·32, tarsus only 0·88.

Distribution.—This curious Stint is a rare straggler to Ceylon, and has only been, to my knowledge, procured on two occasions. Layard obtained two specimens at Point Pedro; and Mr. S. Bligh writes me that he met with a few this last cold season in the Yāla district, and shot a female (the specimen now before me) on the 21st of February last (1879). It was met with at the upper end of the large salt lagoon behind the town of Hambantota, and was in company with some Curlew- and Little Stints. It is probable that limited numbers, perhaps more in some seasons than others, visit Ceylon; but they naturally remain unnoticed amidst the myriads of Stints that yearly come and go.

In India, being a sea-coast bird almost entirely, its numbers are not nearly so great as those species already noticed, and it is, according to Jerdon, rare in the south. Regarding all the notices of Broad-billed Stints in 'Stray Feathers' to apply to the western form, we have Mr. Hume recording *L. platyrhyncha* as rare in the Calcutta district, half a dozen specimens being all he noticed in the market in as many years. In the Irrawaddy delta Dr. Armstrong says that it is "excessively common throughout the entire district lying between the mouth of the Rangoon river and China Bakeer. It was also common along the margins of all the creeks and nullahs in the vicinity, extending up the Rangoon river as far as the junction of the latter with its Pegu tributary." In Tenasserim it is only a straggler; the same gentleman procured it once at Amherst, but Mr. Davison never met with it. At the Andamans it is likewise rare, for Mr. Davison only met with a few associating with a small flock of *Tringa minuta.* It was not seen at the Nicobars. It has been obtained in Java by Reinhardt, and doubtless wanders occasionally to Sumatra down the Malay Peninsula. Salvadori records it doubtfully from Borneo; and I am not aware that it has been seen in any other island in Malasia. It is probable that all these Malay birds belong to the so-called eastern form obtained in China, Hainan, and Formosa by Swinhoe.

In regard to North-west India, Mr. Hume states that it is very common in the Kurrachee harbour and along the Mekran and Sindh coasts; but he has no evidence of its being found anywhere inland, for in an examination of the great rivers of Upper India he never saw a specimen in the "Central Provinces, Oudh, Behar, the North-west Provinces, Rajpootana, or Sindh above Kotree;" nor has he ever met with a specimen in numerous collections from those provinces. We may therefore conclude, as it is not recorded from the Deccan nor by Mr. Ball from the Godaveri-Ganges district, that it is purely a littoral form.

Severtzoff did not observe it on passage in Turkestan, nor do Messrs. Stoliczka, Scully, and Henderson record it from Kashgar. Mr. Seebohm did not meet with it on the Yenesay; even in Western Siberia it was not the lot of Dr. Finsch, in his extensive travels, to see it; so that we may conclude that, as far as Indian birds are concerned, those in the north-west pass by way of Persia, Arabia, and Palestine into Europe, and those in the eastern parts (Burmah, &c.) migrate to North-east Siberia, where Middendorff found it on the Sea of Okhotsk. Neither Schrenck nor Prjevalsky met with it, and it is not recorded from Japan. In China Swinhoe says that it is found in winter, as also in Formosa; and Père David remarks of it that, though frequent in Formosa, it is only found in small numbers on the coast of China; he observed some examples in the Shanghai market in April and May. It has not been met with hitherto in the Philippine Archipelago; but it ranges south probably along the Siam coast into the Malay Islands, for Reinwardt procured it in Java, and Salvadori records it, though doubtfully, from Borneo.

In Europe it is confined to the north in the breeding-season, and is found on passage in the south-east and as far west as Belgium, where it has been obtained on the Meuse. In Germany it occurs rarely on passage, and is more often seen in spring than autumn. On the northern coasts of France it is met with, says Mr. Dresser, at irregular intervals, and is found on the south coast as well. Mr. Goebel and Professor von Nordmann record it from the neighbourhood of Russia. It occurs but rarely in Sicily. Messrs. Elwes and Buckley record specimens as having been obtained on the Bosphorus by a Mr. Robson.

As regards its breeding-habitat: it was found nesting in Norway and Lapland, north of 58°, by Messrs. Collett and Wolley; and it occurs in the Archangel district also in summer. Though it breeds in the north of Sweden and Norway, it is met with only on passage in the autumn in the south of Scandinavia, as also in Denmark and in the islands near Rügen. It is rare in Germany, being chiefly seen during the spring migration. As it is not found in Spain, it would not, as a matter of course, occur in Morocco; and I find no reference of its having been obtained in Algeria. In Egypt Capt. Shelley does not seem to have met with it; but Von Heuglin shot it once near Suez in August, and believes that he saw small flocks in September near Ras-Belul, on the African coast of the Red Sea; he states that Hedenborg procured it in Egypt; but from these few occurrences it is evident that it is not a regular visitor to this region. That it passes rarely down the east coast of Africa is proved by its having been procured in Madagascar.

Habits.—This fine Stint frequents the mud banks on the borders of tidal rivers, and the sands and ooze on shores and lagoons respectively, and appears to be almost more restricted to the vicinity of the sea-coast than any other of the more common members of its genus. It is found in small parties of less than half a dozen in number or singly, and associates with the Little Stint and other small congeners. I have never had an opportunity of seeing it alive; but Von Heuglin informs us that it resembles the Dunlin in its carriage, actions, and flight, and that when on the wing it goes in tolerably close company. Mr. Dresser, who observed it off the coast of Uleåborg, in Finland, writes that it resembles the Jack Snipe in its flight: of its note he cannot speak, as he did not hear it; but I should say it probably resembles that of other Stints. In the breeding-season, according to Mr. Wolley, it makes a faint twittering noise.

Nidification.—In Europe this bird has been found breeding in Lapland, and in Norway on the Dovrefjeld. The situations chosen are, writes Mr. Wolley, "open soft places on the marsh where there is little else than bog-moss with a light growth of a kind of sedge; and on a low tuft just rising above the water its nest may be found, often without much difficulty. . . . . Many empty nests may be found for one that is occupied; and I suppose them to be nests of former years; for the moss in which they are usually worked long retains any mark made in it, being hard-frozen for more than half the year. They are neatly rounded hollows, and have a few bits of dry grass at the bottom. The bird sometimes flies and sometimes runs off her eggs; and if she has sat for a day or two she will come back even whilst men are standing all around."

Mr. Mitchell, who found it nesting on the Dovrefjeld, writes to Mr. Alston some interesting notes, which I extract from Mr. Dresser's 'Birds of Europe':—"It is rather curious to notice how the lining of the nest is suited to the colour of the eggs. The darkest ones are laid on the brown withered leaves of the mountain-willow, while one nest, the eggs of which were as light as Dunlins', was lined entirely with grass; several others were mixed with it. . . . The nests are more elaborate than most of the Sandpipers', scratched deeper down,

and more carefully lined. The old bird sits so closely that she never gets off until your foot is nearly upon her." The eggs are laid from about the middle of May until the middle of June. They were beautifully figured some years ago by Mr. Hewitson, and are very remarkable, inasmuch as some are of a type quite abnormal for a Wader. These have the appearance at a distance of almost uniform chocolate-brown; they are of a yellowish-stone ground, but so thickly stippled with chocolate-brown that the surface is almost completely covered with this colour. Others are of a dusky yellow ground, more openly stippled and speckled with chocolate-brown, intermixed with a few streaks of black, and are scarcely less dark in character than the first-named. Some, again, are olivaceous stone, spotted numerously with dark clear brown (lighter in some than in others), under which are bluish-grey spots. Others, again, are greyish stone-colour, handsomely blotched throughout with irregular and broken markings of dark sepia over spots of bluish grey and clouds of light greyish brown, and intermingled with streaks or scratches of blackish brown. Two eggs in the fine series before me, taken in Lapland, and in the possession of Mr. Dresser, are of the chocolate type, with bolder markings round the large end than in the first-mentioned. Examples measure 1·23 by 0·92 inch, 1·23 by 0·87, and 1·34 by 0·88.

Genus STREPSILAS*.

Bill rather short, conical, wide at the base; the tip acute and the culmen flattened at the base, and slightly upturned from the nostril to the tip; nostrils linear, placed in a depression; gonys pronounced. Wings long and pointed; the 1st quill the longest. Tail moderately short, cuneate, of 12 feathers. Legs rather short; the tarsus protected with transverse scutes, and not longer than middle toe with its claw. Toes divided to the base, but bordered by a narrow membrane; outer toe scarcely longer than the inner; hind toe well developed; nails straight.

* I place this remarkable genus among the Scolopacidæ, of which it appears to be an aberrant form, resembling the Stints in its deportment, actions, and many of its habits, but differing from them in the peculiar structure of its bill, and *partly* in its mode of feeding. Its change of plumage in the breeding-season is somewhat analogous to that of the *Tringæ, and its egg is purely Scolopacine.* It has been erroneously placed by many in the family of Sea-Plovers (Hæmatopodidæ), owing to the structure of its bill; but this organ is most variable and perplexing both in the Scolopacidæ and Charadriidæ, and consequently unsafe as a basis of classification; and the bird has nothing whatever in common with the Oyster-catchers.

STREPSILAS INTERPRES.

(THE TURNSTONE.)

Tringa interpres, Linn. Syst. Nat. i. p. 248 (1766).

Strepsilas interpres (Linn.), Ill. Prod. p. 263 (1811); Gould, B. of Eur. iv. pl. 318 (1837); Jerdon, Madr. Journ. 1840, xii. p. 211; Gould, B. of Austr. vi. pl. 39 (1848); Blyth, Cat. B. Mus. A. S. B. p. 271 (1849); Middendorff, Sibir. Reise, ii. p. 213 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 110; Jerdon, B. of Ind. iii. p. 656 (1864); Schlegel, Mus. P.-B. *Cursores*, p. 43 (1864); Finsch & Hartl. Fauna Centr.-Poly. p. 197 (1867); Swinhoe, P. Z. S. 1871, p. 408; Holdsw. P. Z. S. 1872, p. 472; Buller, B. of New Zeal. p. 221 (1874); Salvadori, Uccelli di Born. p. 320 (1874); Dresser, B. of Eur. pt. 35, 36 (1875); Legge, Ibis, 1875, p. 401; Irby, B. of Gibraltar, p. 163 (1875); Le Messurier, Str. Feath. 1875, p. 380; Hume, ibid. 1876, p. 464, et 1879, viii. (List B. of Ind.), p. 112; David & Oustalet, Ois. de la Chine, p. 433 (1877); Feilden, Ibis, 1877, p. 405.

Charadrius cinclus, Pall. Zoogr. Rosso-As. ii. p. 148 (1831).

Cinclus interpres (L.), Layard, B. of S. Afr. p. 301 (1867); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1037 (1873); Hume, Str. Feath. 1873, p. 233, et 1874, p. 292.

Le Coulon chaud, D'Aub. Pl. Enl. p. 856; *Le Tourne-pierre*, Buffon; *Steinwältzer*, German. *Kotan*, Ceylonese Tamils; *Kiojo-shigi*, Japan; *Kuling*, Pelew Is.; *Pimpeng*, Borneo.

Adult male and female (Ceylon). Length 8·0 to 9·6 inches; wing 5·9 to 6·4; tail 2·5 to 2·7; tarsus 0·95 to 1·05; middle toe and claw 1·0 to 1·1; hind toe 0·2; bill at front 0·8 to 0·97, to gape 1·03 to 1·07.

Females average larger than males; in the above series 6·0 inches is the largest male wing-dimension.

Iris brown; bill black; legs and feet light orange-red; joints of feet dusky; claws blackish.

Male, breeding-plumage (Norway, 15th June). Back, rump, base of tail, body beneath from the chest, together with the under wing, pure white; forehead, cheeks, sides of the neck, fore neck, chest, and lower part of the hind neck jet-black—the black forehead is joined to the cheeks by a stripe passing underneath the eye; lores, above the black forehead and over the eye, the ear-coverts, chin, and centre of the throat pure white; crown and nape black, with broad white edges to the feathers, the white predominating on the nape and hind neck, and passing in a broad band on each side towards the chest; some of the lower hind-neck feathers, most of the scapulars, and the median wing-coverts cinnamon-red; terminal portion of many of the scapular-feathers greenish black; least wing-coverts, winglet, primary-coverts, and quills blackish brown; greater wing-coverts white, with a black patch on the outer webs; shorter primaries with a white patch near the base of the outer web; primary-shafts whitish; underlying scapulars and a tuft of feathers next them on the bend of the wing pure white; a band of black across the middle of the upper tail-coverts; terminal portion of tail black; outer tail-feathers white, with a black spot near the tip, the adjacent feathers tipped with white.

Male, winter (Ceylon). Black bands of the forehead, cheeks, and face, as also the black of the sides of the neck, chest, and breast, duller than in the summer dress, and most of the feathers tipped with white, detracting from the uniformity of these parts; the stripe from the cheeks to the lower mandible generally incomplete; the head and hind neck brown, the feathers edged pale, and the white of the forehead above the band obscured by brownish feathers; the ear-coverts brownish; the upper back and scapulars brownish black, some of the tertials and scapulars tipped with brownish rufous; the wing-coverts brown, with whitish edgings; the feathers of the upper part of the upper tail-covert band tipped with white.

In March, during moult, examples vary much in the white coloration of the face and head and the rufous of the back and wings; the tertials and greater wing-coverts generally show the rufous colour first.

Female, summer (Norway, June). Intermediate between the above-described specimens; the black markings of the head, neck, and chest are not so bold as in the male, and they are intermingled with a few white feathers; the rufous coloration of the scapulars, back, and wing-coverts is less in extent and obscured with brownish, shading into black on the centres of many of the feathers; the white loral patch and the frontal band are not so well defined as in the male in summer, but not so obscured as in that sex in winter.

Young, nestling (three days old). Down "blackish grey, slightly washed with yellowish, and here and there tipped with black; along the crown a narrow black band reaching to the forehead, though not quite to the base of the bill; a similar stripe extends from the base of the upper mandible to the eye; and there is a black spot at the gape; sides of the throat grey; belly white; wings and scapulars coloured like the back." (*Dresser*, fide *Collett.*)

Immature, first autumn (25th September, Colombo). Back, rump, and under surface as in the adult female; head and hind neck brown, the feathers edged with fulvous; interscapular region and scapulars glossy brown-black, the latter tipped with whitish, and some of the feathers margined with rufescent buff; tertials and wing-coverts brown, edged with rufescent; cheeks whitish, patched with blackish brown next the throat, which, with the chin, is white; fore neck and chest brownish black, the feathers slightly margined with rufescent, and at the sides of the chest an obscure whitish fulvous-tinged black-tipped band; inner lesser wing-coverts next the white scapular-feathers white; tail-feathers tipped with rufescent grey.

Females in the second year (shot in spring) resemble the above in having the lores brown; but the wing-coverts and scapulars are tipped with greyish white, as are also the pectoral feathers, and there is more white at the bend of the wing.

Obs. In a series examined from Europe, Asia, America, and the Atlantic isles the measurements are:—wing 5·8 to 6·3 inches; tarsus 0·9 to 1·05; bill to gape 0·9 to 1·0. Mr. Hume records the weight of examples killed in Sindh as 3·75 to 4·3 oz. Vastly distributed almost over the entire universe as this species is, there is, however, another which shares with it the occupation of the northern shores of America; it is the *Strepsilas melanocephala* of Vigors. It has the head, neck, throat, interscapulars, and wings glossy brownish black, with the chin whity brown, and the dark plumage of the fore neck pale-margined: the secondaries for the most part and a band on the wing-coverts extending out from the shoulders are white, as in the common species; back, base and tip of tail white, the terminal portion of the tail and a band across the rump black; under surface as in *Strepsilas interpres.* Examples from Vancouver's Island measure:—wing 5·8 to 6·2 inches; tail 2·4; tarsus 1·0; bill to gape 1·05.

Distribution.—The Turnstone is common on the north-west coast in suitable localities, as also in the Jaffna Peninsula; it appears to be rare on the opposite side of the island, as I have only seen it once or twice in the Trincomalie district, and that was near Foul Point. It was met with in the Kirinde and Hambantota district in March, but not in any numbers. On the west coast south of Chilaw it appears to be only a straggler. Layard met with it at Colombo; and I have seen young birds on the rocks of the Galle Buck on one occasion. In the north, in the month of March, I observed a few examples on the Pootoor lagoon, near Jaffna; small numbers at the entrance to the Jaffna lake; large flocks on the Erinativoe Islands, at Illipekadua, and on the Manaar flats; isolated individuals at Aripu; and considerable numbers at Karativoe Island. The majority leave the island in April; but Mr. Holdsworth has procured it in August at Aripu, the individual in question being no doubt a barren and non-migratory bird. I have also seen it at Chilaw. It frequents the coasts of India, but does not seem to be common north of Madras and at the head of the Bay; and on the Burmese and Tenasserim coasts it appears, curiously, not to have been observed. No one but Blyth has recorded it from the Calcutta district. Jerdon remarks that it is found on the rocky beds of large rivers, and states that he procured it in the Deccan more than 200 miles inland. Mr. Adam has likewise met with it in September at the Sambhur Lake, which is still further from the coast; but as the specimens he alludes to were observed in September, they were evidently birds on passage from the north. On the Laccadives it was the commonest bird in the group when Mr. Hume visited it; and in the Andamans and Nicobars it is widely distributed, though not abundant. It is recorded in 'Stray Feathers' as abundant in Kurrachee harbour in the cold season; and Major Le Messurier met with it on Baba Island, off the Sindh coast, in August. It has been observed on the Mekran coast; and in the Gulf of Oman Capt. Butler saw it in May; he likewise states that it is to be seen at Kurrachee in the hot weather. It is probably found on all the islands of the Indian

Ocean. It inhabits the Comoro Islands; and Mr. Newton observed it in the Seychelles at Curieuse, and also on the island of Rodriguez in September; he likewise met with it in Madagascar, on the east coast, in the same month; and from this island it is also recorded by Messrs. Schlegel and Hartlaub.

It migrates across the continent of Asia to the extreme north of Siberia; but does not seem to have been noticed on the Ob or Yenesay. On its passage to Northern Asia it occurs in the north-west of Turkestan, and likewise traverses the highlands of Kashgaria, where it was met with in September by Dr. Henderson near Yarkand. On the Taimyr river, in lat. $73\frac{1}{2}°$, it was seen by Von Middendorff; he found it breeding there, and noticed that it had left that region by the 10th of August; he also saw it on the Boganida, and in the sea of Okhotsk met with it on Shantar Island. Dr. Dybowski says that it is not uncommon during migration in Kultuk. It is found in Japan, and is pretty common on the mainland, being also met with in Yezo. It does not seem to pass over the Mongolian territory on its way south in winter; and probably this is the reason why it is so scarce on the Burmese coasts. It is, however, found on the shores of China in winter, and visits Formosa and Hainan; in the latter island Mr. Swinhoe found it in large numbers in March on the Poochin river. It does not seem to have been noticed in the Philippines; but it has evidently been passed over there, as it is found in the Pelew group, further east; and it has recently been obtained in the Admiralty Islands by the 'Challenger' naturalists. It is distributed throughout all the Malay archipelago, having been recorded from Borneo by several explorers, and also from Java, Banka, Timor, Ternate, Halmahera, Morotai, Ceram, and Celebes, in which latter island Dr. Meyer procured it in March. The large island of New Guinea is, as a matter of course, visited by it; and from Torres Straits Gould records it in full summer plumage; so that it is possible it may breed on some of the islands of the archipelago. It is found all round the coasts of Australia, extending to Tasmania. In New Zealand it was obtained in 1870 on the Ninety-mile Beach; and since then Dr. Haast and Captain Hutton have procured it, in the latter case in summer plumage. It is found in New Caledonia; and recently Layard records it from Viti Levu and the island of Koro, in Fiji. Mr. Leopold Layard also believes he saw it in the New Hebrides, from where Gray records it, as well as from Aneiteum. It has been obtained in the Samoa, the Viti, the Sandwich, and the Marianne groups, as also in the islands of Ponape and Niafou, and doubtless occurs throughout all Oceanica.

Turning towards Europe, as regards its distribution in which I have space only for an outline, we find that it is common on the shores of the Caspian, a spring and autumn visitor on the coasts of the Black Sea and the sea-board of Greece, an occasional visitor to Turkey, that it appears irregularly in Malta and Gozo, occurring there in May, August, and September, a bird of passage in Sardinia and Sicily (in the former during the spring chiefly), and also that it is found in the Balearic Islands, in which Von Homeyer was informed that it bred. It is said to be rare in Italy. Looking towards the north of Europe, we find that it is a bird of passage in Belgium, and that it occurs chiefly in winter in Holland. In Denmark it arrives in spring and breeds in many localities; and northward of this it is found more or less commonly on the shores of the Baltic, in the Gulf of Bothnia, on the coasts of Scandinavia and Northern Russia, extending to Nova Zembla, where Von Baer met with it; and further north still to Spitzbergen, where Professors Newton and Malmgren observed it in the month of July, and whence there is a specimen in the Stockholm Museum, procured by the collectors of the latter gentleman. It has also been observed in Central Russia during migration. In Great Britain it is common in spring and autumn; and on the west coast of Scotland it is seen as late as June, reappearing in August; and it is believed to breed in the Shetlands and Hebrides. In the Faroes Capt. Feilden found it in pairs in June; and it very probably breeds in these islands, although he was unsuccessful in finding its eggs. It is common in Iceland from April until autumn; but it was also obtained by Faber there in December. It breeds both in North and South Greenland, and was obtained on Sabine Island by the last German Arctic expedition. During the expedition of 1875–76 Captain Feilden writes that it was found tolerably abundant in Smith Sound, and was observed as late as 5th September in lat. 82° 30′; it was first noticed on the 5th of June near the winter-quarters of the 'Alert,' and by the 12th of August the young broods were able to fly. Returning to Europe, we are told that it is tolerably numerous on the coasts of France in autumn, but rare on those of Portugal; and in the south of Spain Col. Irby has observed it in spring and autumn. According to Favier it is found in Tangier in September and February, and occurs sometimes on freshwater lakes. It occurs in Algeria during migration, and has been recently obtained at Damietta in Egypt. Von Heuglin met with it on the Red Sea in May and July; and it likewise breeds there, as he saw

young and old birds at Ras Belul in September, and observed the species on the east coast of the continent as far south as Zela and Berbera. Vierthaler also met with it on the White Nile. It extends southwards along the whole coast to Mozambique and Zambesi; and at the Cape is resident, Layard believing that it breeds there. Up the south-west coast it is not uncommon, and has been observed at various places northward to the Gold Coast. Between this and Morocco it does not seem to have been met with. In the Canaries, the Azores, and Madeira it is not uncommon; and Mr. DuCane Godman believes that it breeds in Flores and probably in the Canaries, in which latter islands Dr. Bolle says it is a constant resident, he being also of opinion that it must breed in some of the group.

As regards the range of the Turnstone in the New World, Mr. Dresser writes:—"On the American continent the distribution of this species is almost equally wide, as it is found from the Hudson's-Bay Territory down to the southern portion of South America. Capt. Blakiston states ('Ibis,' 1863, p. 130) that he received several specimens from York Factory, where he observed it in August; and in the 'Fauna Bor.-Am.' Mr. Ross gives it as a rare bird on the Mackenzie. On the east coast of North America I observed it on the shores of the Bay of Fundy, where, however, it is rare. It is met with during the seasons of migration, or in the winter, on the shores of eastern North America in tolerable numbers. Mr. Elliott Coues says that in North Carolina it is very common during migration, and some winter there." Mr. Dresser himself met with it in Texas, procuring it in June at Galveston. He further adds:—"On the west coast it was met with by Messrs. Dall and Bannister in Alaska, where, Mr. Dall says, it was not common at the mouth of the Yukon; and, according to Dr. Finsch, it was obtained in Amachnak, near Unalaschka, at the end of August, by Von Kittlitz. Southward it is met with as far as Chili." In the latter it was obtained by the 'Novara' expedition; and Dumon procured it in Peru, as well as in the Galapagos Islands. Mr. Salvin states that it inhabits both coasts of Guatemala; and Mr. Lawrence says that it was obtained in Mexico on the Rio Zacatula. In the Bahamas it has been met with in April, and it has also occurred in Bermuda. Gosse observed it in Jamaica; and in Cuba it is stated by Dr. Gundlach to be common from September till May. In the island of St. Croix Professor Newton met with it in April, and Mr. E. Newton in September.

Habits.—As will be gathered from its distribution above sketched, this interesting bird is purely a littoral species, rarely being found away from the sea-shore, except during the course of its migration. It frequents the sandy shores of the vast area of the globe just referred to, and subsists on small sand-worms, sand-flies, and other marine insects and their larvæ, as well as tiny crustaceans and minute shells, which it swallows whole, and which it is said in a great measure to find beneath pebbles, stones, large shells, pieces of seaweed, dead fish, or any other substance lying on the beach, and turned over by it with its upcurved bill. In Ceylon I have found it on the pebbly sand flats on the north-west coast, about the beaches of the islands, and sometimes at the edge of the ooze just after the ebb of the tide, or, again, on the margins of shingly lagoons near the shore in the south-eastern district. It is frequently noticed singly or in small parties of three or four, as well as in considerable flocks, which feed in scattered company, and consort with the Mongolian Sand-Plover, the Curlew- and the Little Stint. It is a very elegant bird in its actions and deportment, running swiftly, then suddenly stopping and peering down among the pebbles, its small head and well-proportioned frame forming a graceful outline against the foaming tide. It cannot be called a very shy bird, though it will not permit a very near approach, generally rising when one is within 50 or 60 yards of it. Its flight is swift and strong; its long-pointed wings are beaten rapidly, and then often extended for an instant, when it will glide along for some little distance and then resume its course, flying generally low. It has been recently proved that it swims about a good deal. Mr. Hume writes of it in the Laccadives as frequently swimming outside the breakers surrounding the reefs there. He remarks that "they rose out of the water with the greatest ease, took short flights, and dropped down again into the sea, in which they appear to be perfectly at home." It likewise perches on elevated objects, thus showing its affinity to the Sandpipers. Swinhoe writes that in Hainan "they sat on the fishing-stakes, and ranged themselves in rows on the ropes that ran from stake to stake." In the Andamans also Mr. Davison observed them sitting on the gunwhales of "boats, in company with the Common Sandpiper." I have never observed them turning over stones in search of food, but have only noticed them picking it up in the ordinary way. Audubon, however, has seen them turning over oysters and clods of mud, and relates that "whenever the object was not too large the bird bent its legs to half their length, placed its bill

beneath it, and with a sudden quick jerk of the head pushed it off, when it quickly picked up the food which was thus exposed to view, and walked deliberately to the next shell to perform the same operation." The most remarkable instance of the skill and instinct of the Turnstone that has yet been published is that of the scene witnessed on the Banffshire coast by the Scotch naturalist, Thomas Edwards, whose life has lately been written by Mr. Smiles. The first account appeared in the 'Banffshire Journal' of Dec. 31, 1850, and it afterwards reappeared in the 'Zoologist' for April 1851. Having noticed a pair of small shore-birds engaged with some large object on the beach, Edwards, with his wonted enthusiasm, crept into a hollow in the shingle which was close to the birds, and was thus enabled to minutely scrutinize their actions. I transcribe here a portion of the interesting narrative of what he saw from the book in question; and I doubt not that in the main particulars it is a faithful account of what happened, as Audubon testifies to the birds using their breasts in pushing over heavy objects:—

"Having got fairly settled down in my pebbly observatory, I turned my undivided attention to the birds before me. They were boldly pushing at the fish with their bills, and then with their breasts. Their endeavours, however, were in vain: the object remained immovable. On this they both went round to the opposite side, and began to scrape away the sand from beneath the fish. After removing a considerable quantity, they again came back to the spot which they had left, and went once more to work with their bills and breasts, but with as little apparent success as formerly. Nothing daunted, however, they ran round a second time to the other side, and recommenced their trenching operations with a seeming determination not to be baffled in their object, which evidently was to undermine the dead animal before them, in order that it might be the more easily overturned.

"While they were thus employed, and after they had laboured in this manner at both sides alternately for nearly half an hour, they were joined by another of their own species, which came flying with rapidity from the neighbouring rocks. Its timely arrival was hailed with evident signs of joy. I was led to this conclusion from the gestures which they exhibited, and from a low but pleasant murmuring noise to which they gave utterance so soon as the new-comer made his appearance. Of their feelings he seemed to be perfectly aware, and he made his reply to them in a similar strain. Their mutual congratulations being over they all three set to work, and after labouring vigorously for a few minutes in removing the sand, they came round to the other side, and, putting their breasts simultaneously to the fish, they succeeded in raising it some inches from the sand, but were unable to turn it over. It went again into its sandy bed, to the manifest disappointment of the three. Resting, however, for a space, and without leaving their respective positions, which were a little apart the one from the other, they resolved, it appears, to give the work another trial. Lowering themselves, with their breasts close to the sand, they managed to push their bills underneath the fish, which they made to rise about the same height as before. Afterwards withdrawing their bills, but without losing the advantage which they had gained, they applied their breasts to the object. This they did with such force and to such purpose that at length it went over, and rolled several yards down a slight declivity. It was followed to some distance by the birds themselves before they could recover their bearing.

"They returned eagerly to the spot from whence they had dislodged the obstacle which had so long opposed them; and they gave unmistakable proof, by their rapid and continued movements, that they were enjoying an ample repast as the reward of their industrious and praiseworthy labour. I was so pleased and even delighted with the sagacity and perseverance which they had shown, that I should have considered myself as guilty of a crime had I endeavoured to take away the lives of these interesting beings at the very moment when they were exercising, in a manner so happily for themselves, the wonderful instincts implanted in them by their Creator. When they appeared to have done and to be satisfied I arose from my place of concealment. On examining the fish I found it to be a specimen of the common cod. It was nearly three feet and a half long, and it had been imbedded in the sand to the depth of about two inches."

The note of the Turnstone resembles somewhat that of some Sand-Plovers, and is a lively-sounding *kēēt-e-krek, kēēt-e-krek,* twice repeated.

Nidification.—The Turnstone breeds in June, resorting to islands or lonely spots on the shores of the mainland in northern latitudes where the soil is sandy and interspersed with bushes, small shrubs, or broad-leaved plants scattered about, under which it often makes its nest. This is said to be a depression in the soil

sometimes sparingly lined with a few grass-bents or roots mingled with, perhaps, one or two dead leaves. The eggs are four in number, and thoroughly Scolopacine in shape and markings, having nothing whatever in common with Sea-Plover's eggs. They are pyriform, and for the most part compressed near the small end; the colour is clayey buff, olivaceous stone, or brownish stone, and the markings, which are in all thickly gathered round the large end, are longitudinal, oblique-running, smeary blotches of umber-brown and olive-brown of one or two shades (in some eggs darker than in others) over clouds, smears, and spots of bluish grey; the smaller half of the egg is boldly marked, but the blots are more circular and are intermingled with small specks. An egg in a fine series of Mr. Seebohm's, before me, is closely spotted or freckled throughout with several shades of brown, and in another the markings are brownish red. In size they vary from 1·52 to 1·7 inch in length by from 1·06 to 1·15 in width. The late celebrated oologist Mr. Hewitson, together with Mr. J. Hancock, were the first naturalists to bring the eggs of the Turnstone to England in the autumn of 1833.

Genus NUMENIUS.

Bill very long, slender, rounded, and curved as a sickle throughout; tip obtuse, projecting over the under mandible; mandibles grooved, the upper for three quarters of its length, the lower for half; nostrils linear and near the commissure. Wings long, the tertials exceeding the primaries; 1st quill the longest. Tail moderate, cuneate. Legs stout, moderately long. Tarsus covered with narrow transverse scutes below, and polygonal ones above; toes webbed at the base and margined by a narrow membrane; hind toe moderate; claws dilated.

The exterior notches on the sternum are wide and deep, and the interior narrow and pointed, the dividing "process" branching outwards.

NUMENIUS LINEATUS.

(THE EASTERN CURLEW.)

Numenius lineatus, Cuv. Règ. An. 2nd ed. i. p. 52 (1829); Blyth, Ibis, 1867, p. 167; Swinhoe, P. Z. S. 1871, p. 410; Hume, Str. Feath. 1873, p. 237; Adam, *t. c.* p. 396; Hume, ibid. 1874, p. 296; Butler & Hume, ibid. 1876, p. 16; Armstrong, *t. c.* p. 341; Hume, *t. c.* p. 464; David & Oustalet, Ois. de la Chine, p. 457 (1877); Hume, Str. Feath. 1878 (B. of Tenass.), p. 460; Davidson & Wender, ibid. 1878, vii. p. 89; Hume, ibid. 1879, viii. (List of Ind. B.), p. 112.

Numenius arquatus (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 268 (1849); Kelaart, Prodromus, Cat. p. 134 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 264; Jerdon, B. of Ind. iii. p. 683 (1864); Schlegel, Mus. P.-B. *Scolopaces*, p. 85 (1864, in part); Layard, B. South Afr. p. 322 (1867); Holdsw. P. Z. S. 1872, p. 474; Legge, Ibis, 1874, p. 29; Salvadori, Uccelli di Borneo, p. 332 (1874); Legge, Ibis, 1875, p. 402.

Numenius major, Temm. & Schlegel, Fauna Japonica, pl. 66 (1847); Blakiston & Pryer, Ibis, 1878, p. 222.

Courlis à taches étroites de l'Inde, Cuv.; *Grey Curlew*, of some. *Goar*, *Goungh*, Hind.; *Choppa*, Bengal., also *Sada Kastachura* (Jerdon); *O-shakushigi*, Japan; *Kutherai Malle Kotan* (lit. "Horsehill Sandpiper"), Ceylonese Tamils.

Adult males (Ceylon). Length 22·5 to 22·9 inches; wing 11·0 to 11·9; tail 4·5 to 4·7; tarsus 3·2 to 3·4; middle toe and claw 1·9 to 2·05; bill at front, along culmen, 5·6 to 6·0. Dimensions of respective parts vary much; in this series the bird with the wing of 11·9 has the bill 5·6.

Adult female. Wing 12·0 inches; tarsus 3·5; bill at front, along culmen, 7·3.

As this species varies much in size, these limits are no doubt occasionally exceeded.

Iris brown; bill dark brown or blackish on the upper mandible, basal half of lower mandible fleshy white, tip generally paler brown than the upper; legs and feet bluish grey or leaden blue.

Head and hind neck with the feathers broadly centred with light sepia-brown, paling off at the edges, in some to greyish white, and in others to pale tawny, the edgings on the centre of the hind neck being always lighter than on the head, and passing round on the sides of the neck and fore neck, where the dark portions are reduced to narrow mesial lines; feathers of the upper back, scapulars, tertials, and wing-coverts centred with darker sepia-brown, paling at the edges to cinereous grey or greyish tawny on the back and scapulars, and to whitish on the wing-coverts; the greater coverts with indentations or marginal bars of white; quills dark brown, the inner webs barred mostly towards the base with white, the 1st primary with a white shaft, and all but the first four with white tips; lower back and upper tail-coverts white: the rump and uppermost of the coverts with mesial blackish stripes, the longer or underlying coverts with interrupted bars or central transverse spots; tail white, crossed with narrow wavy brown bands; lores and face brown-striped, a whitish band above the lores passing as a border round the eye; chin, gorge, and under surface white, the mesial lines of the fore neck continued on the breast, and widening into *narrow* drop-dashes towards the flanks; lower belly and vent unmarked; the under tail-coverts, axillary plumes, and sides of rump with *narrow blackish shaft-lines* near the tips; under wing-coverts white.

In some specimens the axillaries are pure white; and examples shot in Ceylon in March and April are more tinged with tawny on the back and flanks than mid-winter birds. A partial, if not a complete, moult takes place at this time.

Obs. I follow Messrs. Blyth, Swinhoe, and Hume in considering the Indian Curlew distinct from the European; but I only regard it as a *subspecies*, or well-marked Eastern-Asiatic form of that bird. It cannot be separated on account of the different or the variable curvature of its bill, for this is an utterly unreliable character in these large Curlews; nor can dependence entirely be placed on the almost unspotted axillaries, though the

peculiar marking of these feathers accords well with that of the under surface and flanks, which I hold to be the main distinguishing characteristic. The Ceylonese, Indian, Chinese, Japanese, and, curiously enough, the South-African Curlews all differ from their European and Western-Asiatic relatives in having the stripes of the fore neck, chest, breast, and particularly the flanks in the form of narrow, clearly-defined shaft-lines, broader of course on the latter part than on the neck, but still not breaking up into bars or expanding into short and rather roundish drops, as in the true *N. arquatus*; the ground-colour of the neck and chest is always whiter than in the latter, and, as an accompaniment to the narrow stripes of the above-mentioned parts, the axillaries are almost pure white, having merely a narrow shaft-line near the tip, which in some specimens (probably old) is absent. In *some* European Curlews there is scarcely any marking, but what there is takes a transverse form and not a lineal one. I have examined a fine series of Chinese and Formosan examples collected by Swinhoe, and they are all of the *lineatus* type; only one specimen shows any trace of barring on the longer flank-feathers, and this is apparently an immature bird. Swinhoe unites the Japanese form, *N. major* of Schlegel, with the Chinese; and the latter author correctly considers it identical also with the Curlew found in South Africa. This Chinese series measure in the wing 11·5 to 12·5 inches, and in the bill to gape (straight) 6·25 to 7·0. South-African specimens in the British Museum are inseparable from Ceylonese, Chinese, and Indian birds: one example measures in the wing 12·0 inches, bill to gape (straight) 6·8; one from India, wing 11·75 inches, bill to gape (straight) 6·8. There is a specimen from Athens in the national collection which I cannot separate from our form, and there is no reason why it should not be found in such an intervening and somewhat eastern locality as Greece. Indian examples are of course identical with Ceylonese, as the latter migrate to the island by way of the Peninsula. Measurements, according to respective writers, are:— ♀ (*Hume*), wing 11·6 to 12·0 inches, bill at front 6·8 to 7·25, weight 1 lb. 11 oz. to 1 lb. 14 oz.; ♂ (*Armstrong*), wing 11·1, bill from gape 5·2; ♀, wing 11·2, bill from gape 7·2; (*Jerdon*) wing 11 to 12¼, bill at front 4·0 to 6·5. There is great variation in the bill, in the same manner as in the European bird.

N. cyanopus, Vieill., is the Australian representative of this Curlew, migrating northward into China and Amoor Land. The back and rump are brown, with fulvous edgings to the feathers; the underparts are fulvescent, lineated as in the Indian bird, and the axillaries are *barred* with brown. Examples from Australia, including one from Port Essington, measure—wing 11·5 to 12·5 inches, bill to gape (straight) 6·5 to 7·2.

Distribution.—This fine bird, which, like other Waders, is a cool-season migrant to Ceylon, arrives in the island about the middle or end of September, but is not seen in any great numbers until the end of the following month. It is very abundant in the north of Ceylon, frequenting the tidal flats between the Jaffna islands in very large flocks, and is equally numerous down the west coast to Manaar. Great numbers likewise frequent the long shoal which runs out from the Erinativoe Islands, and hundreds find a home on the extensive sands at the northern entrance to the Manaar channel. I have seen it on Karativoe Island and on the Puttalam Lake and near Chilaw, but south of this it is rare. It is occasionally seen at Negombo, and I believe occurs at suitable places down the west coast. I never saw it at Galle; but it is found at Matara, and further east in the Hambantota district it is not uncommon. Thence northwards it is found on all the estuaries, lagoons, and salt lakes on the east coast. It is tolerably abundant in the Trincomalie district, and occasionally wanders from Tamblegam to the Kauthelai tank. The Nilāvele salt lake and the Peria-kerretje lagoon were favourite resorts of the Curlew when I was stationed at Trincomalie. Mr. Parker tells me that he has seen occasional individuals at the Madewatchiya tank, which is quite in the centre of the northern part of the island.

This Curlew is found all round the coasts of India and Burmah; and though it is chiefly a littoral species, it, notwithstanding, occurs on the larger rivers inland, and is likewise, according to Jerdon, found on marshes and lakes in the interior. I do not find it recorded from the Deccan by any observers but Messrs. Davidson and Wender, and they state that it is rare. It occurs on the Laccadives, but not so commonly as the Whimbrel. Mr. Hume procured it at two islets, Cardamum and Aucuttee. In the north-west it is abundant, affecting the rivers in the Punjab and the borders of the Indus; and in Sindh "is nearly equally common," writes Mr. Hume, in the neighbourhood of all the larger inland pieces of water, as well as in the harbour and backwaters of its coast and of the Mekran coast." It is very common in the tank-country of Guzerat, frequenting the edges of jheels in large flocks of two or three hundred, and it arrives there as early as July (*Butler*). It is equally numerous in Kattiawar and Kutch; and in Kurrachee harbour Capt. Butler has seen it all through the hot weather. In Jodhpoor Mr. Hume says it is rare; but on its eastern confines, at

the Sambhur Lake, it is, according to Mr. Adam, frequently met with in flocks of seven or eight. In the Calcutta district it is commoner at the beginning and end of the cold season than during the middle. In Burmah it is said to have been procured at Thayetmyo; and in the Irrawaddy delta it is extremely abundant, says Dr. Armstrong, both along the coast and on the eastern side of the estuary of the river. In Tenasserim it is pretty common along the coast and a little distance inland. Mr. Davison noticed that the majority left in April; but many remained during June, July, and August, and these must have been stationary non-breeding birds. In the Andamans it is not uncommon on the creeks along the shores, and was not observed by Mr. Davison after the 8th April; but Mr. Hume has received specimens, shot in August and September, from Pt. Blair.

This eastern form of Curlew ranges, according to Messrs. Schlegel and Swinhoe, from Japan (where it is the *N. major* of Temminck and the former author) down the coast of China and Formosa to Hainan, and thence into the Malay islands, where it has been found in Java, Sumatra, and Borneo. Mr. Swinhoe procured it in March in Hainan, and says that it was common in Hoehow harbour until the beginning of April. It has been obtained in Sumatra by Henrici, in Java by Kuhl and Van Hasselt, and in Southern Borneo by Crookewit, while in the Leyden Museum there is a specimen from Halmahera. As regards Central Asia, its distribution is not very well defined. Prjevalsky speaks of it as *Numenius major*, and writes that it is common in South-east Mongolia from the end of March to the end of April, where it frequents the shores of small lakes and puddles in the burnt-out steppes. He found it breeding in the Hoang-ho valley, and noticed the first migrants arriving at Koko-nor on the 15th of March, at the end of which month numerous flocks of fifteen to twenty were seen together. At Lake Hanka they were rather common, arriving about the end of March, and some of them stopping to breed about the middle of April. In Amoor Land Schrenck seems only to have met with the southern species above referred to, and which he writes of as *N. australis*, Gould.

Concerning its range in Western Asia I am not prepared to speak. Swinhoe, on the evidence of the identity of the South-African form with the Indian, supposes that it is migratory in the cool season down the east coast of Africa from India; but Layard speaks of it as a stationary species in South Africa. It is probably this Curlew that passes through Turkestan, occurring rarely, according to Severtzoff, in the eastern portions of the country. Canon Tristram did not obtain specimens, though he saw them on the coast of Palestine; and the birds that he considered to be the European Curlew may have belonged to this form. I have not examined skins from Egypt or Abyssinia, and cannot speak as to their identity; but I have mentioned one Greek specimen above which is labelled Athens (whether correctly or not I cannot say). As regards South Africa, Layard writes:—"The Curlew is not uncommon on our sea-board throughout its whole extent. I never heard of its breeding in the colony, though it is found here throughout the year. I met with it up the east coast as far as the Line." It was obtained at Mozambique by Peters; and the Curlew procured at the Seychelles and in Rodriguez by Mr. E. Newton must have been this species. The European form, which migrates down the west coast from Morocco, does not seem to extend further south than Ashantee.

Habits.—In Ceylon the Curlew frequents sand banks and sand flats left bare by the daily receding of the tide, marshy land near the estuaries of large rivers, the margins of salt lagoons, and may sometimes be seen assembled on grass-land near salt lakes and leways. It is, however, seen in far greater numbers on the tidal foreshores of the open coast and the islands on the north-west than it is about backwaters a little distance inland. No shore-bird can be more interesting to the lover of the wild haunts of seafowl than the Curlew. His fine note sounding clearly above the roar of the sea, or startling the ear of the voyager on a moonlight night as he is cruising in a Jaffna canoe on the smooth waters of the north-west coast, has something inexpressibly wild in it, and reminds him of days gone by when he stalked the same wary, cautious bird on the iron-bound coasts of Scotland, or on the grand hill-moors of Yorkshire and Westmoreland, and listened to the same free, far-reaching cry. The time to see them to perfection is when the tide is beginning to leave the waste flats off the north-west coast of Ceylon, and small parties of two, three, six, and more are wending their way towards some chosen feeding-ground, on which the water is just becoming shallow enough for them to wade in. From all directions up and down the coast they come, and shortly after the ground is bare a vast flock of several hundreds are stalking about, uttering their sociable note, quite different from

the wild flight-cry *koi-oirr*. When "beached" in my sailing-canoe some distance from land on a moonlight night I have listened to these assemblies and heard the noise of thousands of Sandpipers, Curlews, Crab-Plovers, &c., gradually increasing as the tide receded, and the ripple of the water against the bottom of my frail craft ceased by degrees, until I was "high and dry," and all was still save the mingled voices of the myriads of birds around me. The flight of the Curlew is powerful and performed with regular beatings of the wings; when alarmed it is capable of proceeding with great speed; and when a flock are together it is a fine sight to see them swerve about in their headlong course, turning first to one side and then the other. When alighting they descend sometimes with great rapidity towards the ground, with half-closed wings, which they spread out on nearing the earth, and so check their course. When walking, the Curlew has rather an awkward appearance; its body is nearly horizontal and its bill pointed downwards ready to snap up its food. It takes little runs of a few paces when catching the sand-flies, mollusks, sea-worms, &c. which it feeds upon, and at other times stalks leisurely about. When winged it runs with considerable speed while being pursued. It maintains its characteristic shyness everywhere, for Layard remarks of it in South Africa that it rarely falls to the gun of the sportsman. Its flesh is in general fishy in taste, and is always inferior to that of the Whimbrel.

I know nothing of the *nidification* of this species. Prjevalsky says that he found it breeding in the Hoang-ho valley in small numbers, and also at Lake Hanka; but no details of its nesting are given. The eggs are, in all probability, similar to those of the European form, which are dusky olive, blotched and spotted with brown, and measure about 2·6 inches by 1·8.

NUMENIUS PHÆOPUS.

(THE WHIMBREL.)

Scolopax phæopus, Linn. Syst. Nat. i. p. 243 (1766).

Numenius phæopus (Linn.), Lath. Ind. Orn. ii. p. 711 (1790); Horsf. Trans. Linn. Soc. xiii. p. 191 (1821); Gould, B. of Eur. iv. pl. 303 (1837); Blyth, Cat. B. Mus. A. S. B. p. 268 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Schleg. Mus. P.-B. *Scolopaces*, p. 93 (1864); Jerdon, B. of Ind. iii. p. 684 (1864); Swinhoe, P. Z. S. 1871, p. 410; Holdsw. P. Z. S. 1872, p. 474; Dresser, B. of Eur. pt. 17 (1873); Gould, B. of Gt. Britain, iv. pl. 49 (1873); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1150 (1873); Salvadori, Ucc. di Borneo, p. 333 (1874); Hume, Str. Feath. 1874, p. 297; Legge, Ibis, 1875, p. 402; Irby, B. of Gibraltar, p. 178 (1875); Walden, Trans. Z. S. 1875, ix. p. 232; Hume, Str. Feath. 1875, p. 183; Butler & Hume, ibid. 1876, p. 16; Armstrong, *t. c.* p. 342; Hume, *t. c.* p. 464; id. ibid. 1878 (B. of Tenass.), p. 460; Butler, ibid. 1878, vii. p. 187; Hume, ibid. 1879, viii. (List B. of Ind.) p. 112; Meyer, Ibis, 1879, p. 142.

Numenius uropygialis, Gould, B. Austr. vi. pl. 43 (1848).

Courlis tacheté de l'isle de Luçon, Sonnerat.

Le petit Courlis, Buffon; *Regenbrachvogel*, German; *Zarapito*, Spanish (Saunders); *Maçarico*, Portuguese (Smith); *Ko-shaku-shigi*, Japanese; *Corbijeu*, Seychelles (Newton); *Little Curlew* of some; *Half-Curlew*, *Jack Curlew*, *Whimbrel-Curlew*, vulg. in England. *Chota goungle*, Hind. (Jerdon); *Malle kotan*, Tamils in north of Ceylon.

Adult male (Ceylon). Length 16·5 to 17·2 inches; wing 9·0 to 9·4; tail 3·9; tarsus 2·3; middle toe and claw 1·55 to 1·6; bill at point, along culmen, 3·1 to 3·5.

Female. Length 17·0 to 17·5 inches; wing 9·3 to 9·5, ext. 30·5; tarsus 2·8.

Iris dark brown; bill dark brown on the upper mandible, deepening at the tip; basal half of lower mandible fleshy, in some fleshy red, darkening to brown at the tip; legs and feet greyish blue or bluish leaden, the joints and toes dusky.

Head, interscapular region, tertials, and wing-coverts dark brown, paling slightly on the hind neck and its sides; the feathers of the neck and interscapular region pale-edged; the scapulars and tertials with marginal pale spots, the coverts with edges and broad marginal spots of white, and the head with a whitish mesial stripe and a smaller patch above the lores; greater secondary coverts barred with white, and the quills and winglet as in the last, the ground-colour of the primaries darker and with a strong greenish gloss; face more or less striped with brown; chin, gorge, breast, lower parts, axillary plume, under wing-coverts, lower back, and rump pure white; upper tail-coverts barred with pale brown; tail light smoky, barred with brown; fore neck and chest thickly lineated with brown on a whitish ground, the markings being more open on the chest, and spreading down to the sides of the breast and flanks in angular bars and terminal shaft-lines; axillaries openly barred with brown; lateral under tail-covert feathers with dark mesial lines; secondary under wing-coverts white, primary series white, with dark shafts, the longer row brown, edged with white.

Birds of the year have the base of the under mandible fleshy, and the bill shorter than in the adult, measuring less than 3·0 inches from gape (straight).

The upper surface and head darker than in the adult, and the rump *barred*, but less so than the tail-coverts; markings of the fore neck darker than in the adult, the axillaries with broader bars, and the under tail-coverts generally centred and spotted with brown, sometimes only with mesial lines of this colour.

Obs. The bill varies in length in this species, but not so much so as the last. The measurements of a Burmese

example (♂) given by Dr. Armstrong are:—"Length 17·5 inches; expanse 28·0; tail from vent 3·8; wing 9·2; tarsus 2·4; bill from gape 3·8. Males from the Andamans are set down by Mr. Hume as measuring in the wing 9·0 to 9·5, and in bill from gape 3·05 to 3·12; weight 12 oz. The dimensions given of the females are exceedingly large:—Length 18·0 to 18·5 inches; wing 9·75 to 10·6; bill from gape 3·5 to 3·58: weight 1 lb. My own measurements are taken from a small series of only six Ceylon examples, and may not therefore correctly represent the maximum size of examples visiting the island. A Heligoland skin in the national collection measures:—wing 9·6 inches; tarsus 3·5; bill to gape (straight) 3·5.

Formosan examples of *N. luzonensis*, Gm.(=*N. uropygialis*, Gould), collected by Swinhoe, resemble entirely *immature Ceylon* birds, having the back marked precisely the same, as also the *axillaries*; and the rump, instead of being pure white, is white barred with brown. On this latter character Gould founded his species, but it is unquestionably an immature sign. Herr Meyer writes me that he shares Salvadori's opinion that this Malayo-Australian form is distinct, from which it may perhaps be inferred (he does not state the fact) that *all* the birds procured in this region have barred rumps; but unless this is the case the species cannot be considered a good one; for in the genus *Numenius*, of all others, it is unsafe to trust to a trifling character such as that in question. A pronounced difference in ground-colour, or a constant type of axillary-marking or coloration, is necessary before we can safely found a good species in this group of birds.

N. minor, Müller, from Australia, the representative of the small *N. borealis* of America, has the axillaries white, distantly barred with pale brown, and the rump and upper tail-coverts are brown spotted with white, while the underparts are buff. An example in Mr. Harting's collection measures 6·8 inches in the wing.

N. tenuirostris, Vieill., conspicuous for its slender bill, has the rump and upper tail-coverts striped with black, and the axillaries pure white. In an example before me, from Malta, the wing measures 9·0 inches.

Distribution.—The Whimbrel arrives early in Ceylon in September, and leaves again in April. It is not so abundant as the last species; and is, I think, found in greater numbers in the Jaffna peninsula than on the east coast. At Illipekadua, seven miles to the north of Manaar, as well as at this latter place, I have seen a good many in March. They are first seen in the Trincomalie district at the end of September and the beginning of October, and to the north of that port are tolerably common, as is also the case at Mullaittivu. Mr. Hayes, of the Ceylon Public-Works Department, has seen it between the latter place and Vavonia Velankulam; but how far inland I am unable to say; according to the experience of Layard and myself, it does not wander inland at all. It extends down the east coast to the Hambantota district, throughout which it is found, but more rarely than in the north. I have seen it at Chilaw and near Negombo, and also at the mouth of the Kelani ganga, near Colombo. It may be heard not unfrequently, during the north-east monsoon, flying over the Galle face at night; and is, I have no doubt, met with here and there, though rarely on the coast to the south of Colombo. I have not myself observed it in the Galle district. Among other places not far from the sea-coast where it is likely to occur is the large tank at Kanthelai.

Jerdon states that this species is found throughout India, and is more abundant than the Curlew. From recent testimony in 'Stray Feathers,' the reverse would appear to be the case. It is almost entirely confined to the sea-coast, and occurs probably all round the Indian sea-board. Dr. Armstrong procured it in Ramisserum Island; and in the Laccadives Mr. Hume found it more numerous than the Curlew, meeting with it on the islands of Kiltan, Amini, and Betra Par. About Calcutta it is not so common as its larger relative, but few specimens being seen in the market during the season. Mr. Hume writes as follows on its distribution in the north-west:—"The Whimbrel is a good deal of a coast-bird, according to my experience, and is comparatively rare in India at any great distance from the sea. Mr. Adam never procured it at Sambhur, nor did I see it there nor anywhere in Jodhpoor, nor in the interior of Sindh, nor has any of my correspondents sent or recorded it from that entourage. Along the coasts of Sindh it occurs, is common on those of Cutch and Kattiawar, and thence round the entire coast-line to Mergui." In Guzerat Captain Butler says it is rare; but he designates it as very common in Kurrachee harbour, some remaining all the year, but not to breed. Major Le Messurier has noticed it in the delta of the Indus in August. Mr. Blanford met with a small Curlew, thought to be this species, in the Persian Gulf. Eastward it has been obtained at Thayetmyo in Burmah, and in the Irrawaddy delta Dr. Armstrong found it common. "It occurs," writes Mr. Hume, "in Tenasserim; but rather sparingly along and near the coast throughout the province." Mr. Davison has seen it about the Tavoy river in July; so that barren birds appear to remain in various places throughout the year. In the Andamans and Nicobars it is, says this gentleman, oftener met with than the Curlew. It was seen at

Port Blair in the second week of May, and it was also procured on the 16th of September; it was usually seen in small flocks, which fed on the mud banks left exposed by the ebb of the tide.

If we unite the Australian and the Asiatic forms, we find this Whimbrel occurring in the Philippines and throughout the Malay Archipelago. Herr Meyer has been kind enough to inform me that it has been procured in the following months from the islands here named:—January: Amboina, Cebu, Malanipa (near Zamboanga). February: Amboina, Waigiou, Gebe, Timor. March: South Celebes, N. Celebes, Batchian, Waigiou, Admiralty Islands. April: N. Celebes, Halmahera, Ceram, Flores, Jobi. May: Ternate, Waigiou. June: New Guinea. July: New Guinea. August: Mactan (Philippine Isl.), Central Celebes (Gulf of Tomini). September: Morotai, Batchian, Kei, Aru. October: Ternate, Borneo. November: Halmahera, Ceram, Timor. December: Cujo (Philippine Isl.).

It has also been obtained in Sumatra and Banka. It is recorded by Mr. Gould as occurring in winter throughout the coasts of Australia, including Tasmania, as also by Mr. Ramsay in his recent "Distribution" list. Turning north again, we find Swinhoe recording it from Formosa and the southern coasts of China, as also from the maritime region between Pekin and Shanghai. In Japan, according to Messrs. Blakiston and Pryer, it has been found in Yezo and Tokio, and at Yokohama and Hakodadi. Regarding its distribution in Asia, it does not seem to extend to the extensive northern parts of the continent; for I do not find it recorded from N.E. Siberia, nor from the Yenesay and Ob rivers, although it follows the north-east coast to Kamtchatka, whence it has been recorded. Von Schrenck likewise did not notice it in Amoor Land. Radde, however, met with it in the western portion of East Siberia; and M. Taczanowski obtained it in Dauria.

In Palestine Canon Tristram saw a small Curlew, which may have been this species, but did not procure a specimen. In Southern Europe it is common in winter; but it is seen in greatest numbers in Italy, Transylvania, and Turkey on its spring migration to the north. In the latter country it does not appear to be common; it occurs near Constantinople, and has been seen in Macedonia. In the summer it is found in Northern Europe to the shores of the Arctic Sea, and breeds in Finland, Northern Russia, Scandinavia, and Iceland, in which latter island it is common. It is also found in Greenland. It is abundant at this season in the Faroe Islands. It nidificates as far south as Schleswig Holstein and Great Britain; in the latter of which regions its breeding-places are restricted to the Orkneys and Shetlands, the coasts of Sutherlandshire and Caithness, and it is asserted that it has bred in Yorkshire. It is found in autumn, winter, and spring on the coast of England and in France. In Portugal it is common in winter, and is likewise so in Spain, according to Mr. Saunders. In Andalucia Col. Irby says it is plentiful in autumn and spring, and a few are seen in winter. It inhabits the Azores and the Cape-Verd Islands, in the former of which Mr. DuCane Godman met with it. It has a wide distribution in Africa, extending eastwards to the Seychelles, and also to Madagascar, Mauritius, and Bourbon. In the island of Mahé, in the former group, Mr. E. Newton found it plentiful. It does not appear to be resident on all parts of the north coast in the winter; for Favier says that it arrives early in the autumn in Morocco, and is for a time very common, passing south for the winter. It has been observed in Algeria and Tunis, and in Egypt it remains throughout the winter. Von Heuglin states that it is chiefly an autumn and winter species in North-east Africa, but that he has seen it in spring in Lower Egypt; it has been procured on the Blue Nile and in Abyssinia; Mr. Blanford obtained it at Massowa, and Von Hemprich procured it on the coast of Arabia. It has been observed at Zanzibar on its way south; and in the Transvaal Mr. Ayres obtained it in November; he also noticed it in Natal, where it is, however, not so plentiful as the Curlew. It is stated to be resident in Madagascar, probably owing to barren birds remaining there in the breeding-season. Layard remarks that it is rare in Cape colony, two specimens shot near Cape Town only coming under his notice.

Mr. Andersson obtained it in Walvisch Bay; and north of Damara Land it has been observed at most places on the west coast, including the island of St. Thomas and Gaboon. Captain Shelley procured it on the Gold Coast, and Pel in Ashantee. Governor Ussher says that it is more frequent in Sierra Leone than on the Gold Coast. It is also recorded from Gambia.

Habits.—This widely-distributed species is not so shy as the Curlew, and does not associate in such large flocks. It is frequently noticed alone, or three or four scattered along an extent of half a mile of sea-beach,

each one appearing to be entirely independent of the other. On its first arriving I used to find it frequenting the rocks in the secluded bays in Trincomalie harbour, several being found in one little cove perhaps: at night they resorted from various points to an island to roost; and this habit has been noticed by others, although it must be understood that it is not stationary throughout the night, as it is to a great extent a nocturnal feeder. I have invariably found the stomachs of those shot in the early morning full of food, and sometimes the reverse has been the case when I procured them in the evening. They are fonder of rocks than the Curlew, as they find their favourite food (crabs) in such places; these they swallow whole after breaking off the legs and claws; even when I have shot them on the mud flats bordering large salt lagoons I have found their stomachs chiefly containing small crabs. In spite of its crustacean diet its flesh is better eating than that of the Curlew, which is in general, as I have stated, very fishy. The flight of the Whimbrel is strong and swift, and in style resembles that of the Curlew. When it is proceeding to some distant point, it mounts high in the air, and during its course gives out, now and then, its loud and well-known call, which may always be known from the dissyllabic call of its larger congener by its hoarseness and longer duration. A writer, in speaking of its habits in Iona says, "the unusual and peculiar cry of the Whimbrel announces the fact that summer is nigh. Its call consists of several rapidly-repeated, short and clear whistles, uttered about seven times in rapid succession; whence its name of *Seven Whistler* has been derived. This cry is heard as the flocks are flying to and fro high in the air." Towards evening I have found it shier than in the morning, and it is sometimes so wary that much stalking is required to get within shot of it. Some writers affirm that the Whimbrel is very fond of bilberries and whortleberries; but I am unable to testify to the truth of this statement.

Nidification.—The breeding-season of this species is in June and July. In the hills in Scotland and in the Orkneys it nests on the ground in heathy situations, and uses pieces of heather, dry grass, bents, &c. for the material. Mr. Collett describes the nest as "simply a depression in the soil on the top of some slight elevation in any comparatively dry spot in the marshes, and is usually lined with a few grass-bents or leaves." Captain Feilden, who found it breeding in great numbers in the Faroes, discovered one nest between two blocks of stone, which just gave room enough for the bird to squeeze between. He remarks, "it is of a pugnacious disposition whilst breeding, and is constantly on the alert to drive off intruders from the vicinity of the nest; I have watched them by the hour chasing the Lesser Black-backed Gull (*L. fuscus*). When engaged in these combats their flight is rapid and arrow-like, whilst they constantly repeat their trilling cry, which has not inaptly been described as resembling the words *tetty, tetty, tetty, tet.*" The nesting-time there is in May and June. The eggs are three or four in number; they are dusky olive in colour, blotched and spotted with dark brown, and clouded with the same often at the large end; sometimes eggs are found quite unspotted. They measure 2·3 inches by 1·4.

With regard to Herr Meyer's remarks in the Ibis (1879, p. 142) that this bird breeds in "small trees" in Celebes, he writes me that small bushes were intended to be implied, and that he considers the information he received to be trustworthy.

I take the opportunity of remarking here, at the termination of my articles on the Scolopacidæ, that I have just heard of the occurrence of the Sanderling (*Calidris arenaria*) in Ceylon. An article, therefore, on this species will be given in the Appendix.

GRALLÆ.

Fam. PARRIDÆ*.

Bill moderate, straight, compressed; nostrils pervious. Wings moderately long. Tail in some lengthened, in others short. Legs of medium length; feet enormous; claws very long.

Wing with a sharp spur at the flexure. Sternum not compressed laterally as in Rallidæ, but Charadrine in structure, with a large notch in the posterior margin.

Genus HYDROPHASIANUS.

Bill slender, straight, moderately compressed, the apical portion enlarged and curved; the gonys pronounced; nostrils linear, pervious, placed in a long depression. Wings lengthened, with a stout, sharp spur at the flexure; quills pointed, the 1st with the terminal portion of the shaft produced and slightly webbed, the 2nd and the 3rd with the shaft produced beyond the web, and the 4th with the web attenuated. Tail long, with the central feathers much lengthened during the breeding-season. Tibia bare to a considerable height. Tarsus shorter than the middle toe, and shielded before and behind with rectangular scales. Toes and claws very long, the latter straight; the hind claw much longer than the toe and *curved upwards*.

HYDROPHASIANUS CHIRURGUS.

(THE WATER-PHEASANT.)

Tringa chirurgus, Scopoli, Del. Fl. et Faun. Insubr. ii. p. 92 (1786), *ex* Sonn.
Parra luzonensis, Gm. Syst. Nat. i. p. 709 (1788).
Parra sinensis (Gm.), Schlegel, Mus. P.-B. *Ralli*, p. 71 (1865).
Hydrophasianus sinensis (Gm.), Wagler, Isis, 1832, p. 279; Kelaart, Prodromus, Cat. p. 135 (1852); Gould, B. of Asia, pt. vii. pl. 3 (1855).
Hydrophasianus chirurgus (Scop.), Blyth, Cat. B. Mus. A. S. B. p. 273 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 267; Jerdon, B. of Ind. iii. p. 709 (1864); Swinhoe, P. Z. S. 1871, p. 414; Holdsw. P. Z. S. 1872, p. 475; Hume, Str. Feath. 1873, p. 249; id. Lahore to Yarkand, p. 290 (1873); Salvadori, Uccelli di Born. p. 343 (1874); Legge, Ibis, 1874, p. 30; id. J. A. S. (Ceylon Branch), 1874, p. 54; Hume, Nests and Eggs, iii. p. 592 (1875); Walden, Trans. Zool. Soc. 1875, ix. p. 232; Hume & Oates, Str. Feath. 1875, p. 185; Le Messurier, *t. c.* p. 381; Butler & Hume, ibid. 1876, p. 20; Hume, ibid. (B. of Tenass.), 1878, p. 464; Davidson & Wender, ibid. 1878, vii. p. 89; Ball, *t. c.* p. 229; Cripps, *t. c.* p. 304; Hume, ibid. 1879, p. 113 (List B. of Ind.).
Le Chirurgien de l'isle de Luçon, Sonnerat, Voy. Nouv. Guin. p. 81, pl. 45 (1770); *Chinese*

* The Scolopacine egg, Plover-like bill, spurred wing, strong, straight flight, and general deportment of the Jacanas indicate their position as being between the last family and the Plovers.

Jacana (Lath.); *The Pheasant-tailed Jacana* (Jerdon); *Yellow-backed Jacana* (Sykes). *Piho, Pihuya*, Hind.; *Dal-kukra, Dal-pipi, Jab-manjor Chittra billai*, Bengal.; *Sardal, Sukdal*, also *Miwa* in some parts (Jerdon).

Balal Saaru, lit. "Cat Teal," from its cry; also *Newya*, Sinhalese.

Adult male, in breeding-plumage. Length 16·2 to 18·0 inches; wing 7·8 to 8·1; tail 8·0 to 10·0; tarsus 2·0 to 2·3; middle toe 2·3 to 2·4, claw 0·75; hind toe 0·8, claw 1·2; bill to gape 1·1.

Adult female, in breeding-plumage. Length 18·0 to 21·5 inches; wing 8·5 to 9·25; tail 11·0 to 12·75; middle toe and claw 3·1 to 3·3; hind claw 1·5 to 1·7; bill to gape 1·25; alar spur 0·3 to 0·35.

Iris deep brown; bill light blue at the base, the tip paler or greenish in some; legs and feet plumbeous blue, claws black.

Head, face, throat, fore neck, wing-coverts, secondaries, under wing-coverts, the most part of all but the two outer primaries and the base of the 2nd white; hind neck pale glistening yellow, surmounted by a black nuchal patch, and with a blackish edge at the sides; back and tail blackish brown, with green and bronze reflections on the upper parts; scapulars and tertials dark olive-brown, with greenish reflections, the tertials pale towards the extremities; entire under surface up to the chest, passing up to the interscapular region, purplish black, darkest on the chest and palest on the thigh-coverts; 1st and 2nd primaries black, terminal portions of the remainder and margins of the outer secondaries towards the tip brownish black; 1st primary bare for about an inch from the tip, with a narrow web at the extremity, the next two with the points of the shafts exceeding the web, the 4th and 5th attenuated and rounded at the tip.

Winter plumage. Tail very short, 3·5 to 4·0 inches; primaries apparently not so long; alar spur undeveloped.

The question of the short primaries requires investigation; I have found them shorter in one or two specimens.

Iris yellowish, often with a brown inner circle. Top of head, centre of hind neck, upper back, scapulars, tertials, and central tail-feathers hair-brown, darkening to blackish brown on the rump, and with green and bronze reflections on the back and scapulars; lesser and median wing-coverts pale brown, the terminal portions of the feathers barred with blackish brown and whitish; rest of the wing as in summer, but in some the 2nd and 3rd primaries are similarly pointed to the 1st; supercilium, lower part of eye-fringe, fore neck, under surface, under wing-coverts, and tail white; a black stripe from the gape beneath and down the side of the neck, passing in a band across the chest; above this, continuous with the supercilium, a broad shining yellow stripe; feathers beneath the pectoral band and at the side of the chest mottled with blackish.

In some examples some of the white flank-feathers remain in summer.

The breeding-plumage in Ceylon is donned at the beginning of the year. I have found most birds in the north-west and south-east of the island attired in it in February; and in the south of Ceylon I observed that in October all birds were in winter dress.

The nuptial plumage appears to be put on by a change of colour in the feather. An example in my collection, shot at Kurunegala in February, has the breast-feathers turning black, and those of the hind neck brown and glistening golden, the latter colour appearing at the base; the winter tail-feathers are moulted, and the larger breeding ones acquired simultaneously with the change in the clothing-feathers.

In the north of Ceylon the season of change is perhaps somewhat later; I have obtained birds in *old* feather and still in breeding-plumage in July.

The nestling is figured by Gray and Hardwicke as covered with buff down, tinged with grey on the sides of the neck and with reddish on the wings; a dull stripe through the eye, another down the hind neck and back, and a triple stripe starting from a band behind the wing, the outermost of which descends the thighs.

Young. Immature birds somewhat resemble winter examples; the superciliary line is ferruginous, the fore neck washed with fulvous, and the yellow neck-stripe much paler or less golden than in the adult; the pectoral band is not so strongly developed.

Obs. I find but little variation in this species from other parts of its habitat; but some Chinese specimens I have examined have the hind-neck golden patch very large and the black border very broad. These are probably individual peculiarities. A fine example in the Swinhoe collection measures:—wing 8·0 inches to end of web, 9·0 to end of appendage; tail 12·0. An Indian example in the British Museum measures 7·7 inches in the wing; tail 8·6; tarsus 2·0; middle toe 2·0, its claw (straight) 0·7.

Distribution.—The Water-Pheasant is pretty generally diffused throughout all the low country where there are waters suited to its habits, the tank-districts containing it in large numbers, owing to the abundance of its favourite haunts—lonely, Lotus-covered, jungle-surrounded sheets of water. There is perhaps scarcely a single tank, large or small, from the north down to Kurunegala on the west and to Hambantota on the south-east, which is not inhabited by it in greater or less numbers. It is not so numerous in the larger recently-restored tanks, which are now, as a rule, full of deep water, as in the larger class of village tanks, or those which are still at the mercy of the monsoon rains, which pour through the ruined embankments in great floods, and speedily leave the swampy areas as they were before. In the latter it confines itself to shallow nooks overgrown with weeds and Lotus-plants, while some of the former literally teem with it. On such sheets of water as the Peria kulam, Pan kulam, Kalpé tank, Wenriyan kulam, Topare, and Haborenna tanks, and many such throughout the North-western Province and the Anaradhapura district, it is very abundant. I have met with it at all the tanks of the Eastern Province that I have visited; and Mr. Forbes Laurie tells me that it is very plentiful at Bintenne Lake. In the south-east it is very abundant in some localities, one of which, the tank at Sittrawella, near Tissa Maha Rama, I may cite in particular. It is not so plentiful in the South-west and the Western Province as in the tank-districts; but there are nevertheless localities in the neighbourhood of Matara and between that part and Amblangoda where numbers are to be found. I have met with it near Galle on isolated pieces of water or ponds in paddy-fields. On Bolgodde Lake it affects the shallow and weedy inlets on the shores of this large sheet of water. Near Colombo it is found at Kotte Lake and at Kæsbawa; and in the interior there are other localities frequented by it, it being abundant at the tank close to the town of Kurunegala.

Jerdon states that it is spread throughout India where there are jheels and weedy tanks. We have little data as yet afforded us in 'Stray Feathers' as to the particular localities in South India where it is abundant; and I notice that Mr. Bourdillon does not include it among the species which he saw at the Vellarney Lake, Southern Travancore. Messrs. Davidson and Wender observe that it occurs sparingly in the Deccan; and Dr. Fairbank likewise remarks that it is rare in that district. Mr. Ball says that it is occasionally seen in jheels in Chota Nagpur, and instances the Rajmehal hills, Manbhum, and Lohardugga as the localities in which he noticed it. In Furreedpore Mr. Cripps remarks that it is very common during the rains, and then found in every swamp. From October until March it disappears from that portion of the country. Elsewhere in Bengal we have Capt. Beavan's testimony for its occurrence at Rungpore and Berhampore.

It extends into the north-west of the empire, ascending the hills, according to Mr. Hume, and breeding freely even in Cashmere, in which region Dr. Henderson found it abundant near Banihál. The former gentleman observed it in Sindh at the inland tanks; and Capt. Butler records it as common in Northern Guzerat and the neighbourhood of Mount Aboo, but only during the cold weather. He, however, instances the case of a single example found near Deesa in the hot weather. Mr. Hume remarks that it is not uncommon in Kattiawar, Kutch, and Jodhpoor, as well as in Guzerat, and records it as abundant in the cool season at the Kunkrowlee Lake in Oodeypore. Turning eastward, we find Mr. Inglis stating that it is very rare in North-east Cachar; and in Upper Pegu Mr. Oates only met with one specimen, which he killed in February in winter plumage. In the Irrawaddy delta Dr. Armstrong did not procure it; but Captain Wardlaw Ramsay obtained it at Tonghoo. Three specimens only are recorded by Mr. Hume as having been shot during the rains at Thatone, and he states that its occurrence in Tenasserim must be looked upon as accidental. In the Indo-Chinese and Malayan region it appears to be sparingly distributed, for though we have ample record of its occurrence here and there, we do not find it stated that it is common anywhere, except perhaps in Java, from which island there is a fair series of specimens in the Leyden Museum; it was procured there by Diard. Salvadori records it doubtfully from Borneo; but from what part it is supposed to have come is not stated; it does not appear to have been met with in Sarawak. It was first made known to science from the Philippines, where it was procured in the island of Luzon by Sonnerat, who gave it the singular title of "Chirurgien" (surgeon) of that isle! Von Martens likewise procured it in that island. In Formosa Swinhoe met with it, and he likewise records it from the Amoy coast and from Hankow in the interior.

Habits.—This most singular and interesting bird, which appears to have no slight affinities with the Plovers, affects only such waters as are overgrown with floating vegetation, more particularly the Lotus-plant,

on the broad "bejewelled"* leaves of which it delights to walk, for facile progression on which its remarkable feet eminently adapt it. It may be said to form one of the principal ornithological features of the forest-begirt tanks of Ceylon; for though it is less conspicuous than the larger denizens of these beautiful but lonely spots, yet its graceful form, its walking, as it were, almost on the water, and its singular mewing call, commend themselves more than the attractions of other birds to the notice of the naturalist.

After a long march through the shady forests of the Northern Province, and (if we have chanced to arrive at the upper side of the tank) after threading our way through the low thorny jungle which invariably grows on the seasonally-submerged part of the "Kulam," we emerge from beneath the foliage, and find ourselves suddenly face to face with a scene such as none but those who have penetrated into these wild haunts of tropical bird-life can form any idea of. The weedy waste of water and the dark border of the primæval forest literally teem with birds, while ugly crocodiles are sleeping on the muddy slopes of the "bund," and myriads of frogs basking in the glaring sun send forth their contented croakings. If we have cautiously stepped into the open, and are standing partially screened by a spreading thorn tree, we have an opportunity of seeing the various species either reposing or busily engaged in sustaining life. Close at hand stalk about a dozen or more sombre-clad "Paddy-birds;" further out, standing knee-deep in the more open water, are an equal number of tall and snowy-white Egrets, with perhaps a grey Heron or two, quietly eyeing, with gracefully curved necks, the surrounding water; and on the topmost branches of the lofty trees growing on the opposite bund repose many more of the same birds, with probably two or three handsomely plumaged but ungainly-looking Pelican Ibises, who, having made their morning meal, are complacently viewing the labours of their less fortunate companions. Beneath this company of sentinels, on the lower outspreading branches, sit one or two sturdy Buff-headed Kingfishers, their huge bills pointed downwards, waiting for a plunge into the dark water beneath; and on the largest and most out-reaching limb of a Koombook tree lurks the watchful tank-Eagle (*Spilornis spilogaster*), who, though we cannot see him, has quickly espied us from afar, and is waiting, with crest erect and with his glaring yellow eyes fixed on us, to glide off on the least sign of our moving. On the branch of yonder fallen tree which stands out of the water sit half a dozen Lesser Cormorants with one or two long-necked Darters, drying their expanded wings in the sun; and hard by, careless of the position of their sable companions, are perched a pair of lovely little Kingfishers, who, with jerking tails and bobbing heads, send forth their shrill little whistlings, and now and then dart down on the tiny fish. A flock of Teal are slowly paddling along the edge of the open water, and others sitting on the rock which often rises from the deepest part; while last, but not least, numbers of elegant Water-Pheasants trip lightly over the glistening Lotus-leaves which are crowded into one corner of the tank, some flying across little open reaches of water, and others floating lightly on secluded parts, but all combining to give the finishing touch to the romantic scene.

But what a change in the picture! Some coveted and hapless specimen is sure to be within shot among this long list, and ere long a loud report echoes through the forest. Up start the white-winged Paddy-birds, and with a tremendous splash the frightened crocodiles rush beneath the water, the noisy Kingfishers dart from out the trees with discordant cries, the barred wings of the Eagle carry him quickly upwards, while the Cormorants and Teal career round and round the tank, and the Egrets disappear with loud croaks over the tops of the distant trees, and the affrighted Water-Pheasants, displaying their white wings, fly off to a place of safety and give vent to their fears in loud mewing calls.

But, to return from this long digression (which the memory of many such scenes forces upon the author) to the consideration of the habits of the Water-Pheasant, it may be remarked that it is an extremely noisy bird, particularly in the breeding-season, when the numbers which frequent such localities as I have just described call to each other all night long, their plaintive and not unmelodious notes keeping up an incessant nocturnal concert so loud that I have more than once, when sleeping on the borders of a tank, been kept

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* On nearly every Lotus-leaf is a sparkling drop of water, glistening like a crystal on its green surface. The Thibetan Buddhists worship this. Dr. Henderson ('Lahore to Yarkand,' p. 47) found the words "Hail to the jewel in the Lotus, hail!" inscribed on stones which surmounted the piles called Mānés in Thibet.

awake by it. It flies very well, and, when occasion calls for it, takes long flights. I have seen little flocks crossing the wide Bolgodde Lake at sundown, bent for some distant roosting-place: they flew just above the water, in close company, going along with considerable speed. The Water-Pheasant likewise swims well, and when on the water sits very buoyantly. If wounded it is almost impossible to procure, as it immediately dives, and, as Jerdon truly says, remains immersed with its bill only out of the water, and defies pursuit. Though socially inclined, these handsome birds do not keep very close company, but move about, each intent on its own business, at some little distance from one another. They feed on the seeds of water-plants and on grain when frequenting paddy-fields: in addition to such diet I have found small shrimps in the stomachs of some specimens; and Blyth states that some he kept in confinement throve well on them, and were rather quarrelsome among themselves. Swinhoe justly remarks that when sitting they look dark and unnoticeable; but the wings once expanded they become conspicuous white objects. Their flight is somewhat peculiar, for though there is more time than is usually the case between each stroke of the wing, the beat is in itself very quickly performed. Their gait and deportment are quite different from those of the Rails.

Jerdon has the following note with regard to some of the natives of India and this bird:—"In Purneah the natives say that before the inundation, *i. e.* during the breeding-season, it calls *dub, dub, i. e.* 'go under water,' and afterwards, in the cold weather, *powar, powar*, which, in Purneah dialect, means 'next year.'"

Although the Singhalese idea of its note being like the mewing of a cat is not inapt, yet it must be said that there is but a slight resemblance in the tone of its cry to the voice of this quadruped; it is a much louder and rounder sound, and has a certain amount of intonation in it which would seem very strange issuing from a *feline* throat.

Nidification.—In the north-west of Ceylon this bird breeds in March and April: my friend Mr. Jeffreys, of Hindugalla Estate, informs me that he once found an egg deposited on a floating Lotus-leaf, the incubation of which was being performed by the sun; for at a little distance off the bird was watching it, and sallied out at a Brahminy Kite which flew over the spot. Two eggs taken by Mr. E. Creasey in the Jaffna district, and examined by me in the collection of Mr. MacVicar, were excessively pyriform in shape, showing the bird's affinity to the *Scolopacidæ*, very smooth in texture, and of a uniform deep olive colour. They measured 1·46 by 1·02 inch and 1·36 by 1·03 respectively.

Mr. Hume writes thus of the nest of this Jacana:—"They lay from the middle of June till August; the nest (placed in any pond, jheel, or swamp, just as often on the outskirts of some village or small town as in amongst fields and jungle) is often a mass of weeds and rushes heaped together in the water, in the midst of the thickest grass and rice, and so low that the eggs are half-immersed in water. Occasionally the nests are amongst the grass of some little island, and then they are much slighter. At times, even when constructed in the water, they are so small as hardly to be able to contain the egg—little, shallow, circular cups of rush and water-weed on floating Lotus-leaves or tufts of water-grass." The eggs are laid point to point like the Snipe's and Plover's, and four is the usual number. The same writer says the eggs may be best described as pegtops without the pegs—cones slightly obtuse at the point, based upon somewhat flattened hemispheres; and he remarks likewise that the colour varies a good deal. They are rich deep bronze, sometimes a greenish and sometimes a more rufous-bronze colour; they become bleached by the sun occasionally to a stone-colour. They vary much in size, but average "1·46 by 1·12 inch."

GRALLÆ.

Fam. CHARADRIIDÆ.

Bill hard and not flexible, extremely variable in shape; short in some, long and stout in others, and very slender in one group. Wings pointed; tertials moderately long. Tail short. Legs lengthened and proportionately slender; toes short; *hind toe wanting in most genera*; outer and middle toe joined at the base by a web, as also the inner toe in some.

Sternum generally with wide exterior fissure and a small interior one. Eye large in nearly all. Mostly of gregarious and littoral habit. Plumage in some genera the same throughout the year, in the majority changed at the breeding-time. Nesting on the ground.

Subfam. HIMANTIPODINÆ.

Bill slender and attenuated. Wings pointed; tertials not elongated. Tail short, of 12 feathers. Legs very long and slender; toes united in front by a web, in one genus much developed; hind toe wanting or very minute.

Of moderate size.

Genus HIMANTOPUS.

Bill long, straight, very slender and attenuated at the tip, near which it is rounded; culmen flattened at the base. Nostrils linear, in a groove running half the length of the bill. Wings very long and pointed; 1st primary the longest and much exceeding the 2nd. Tail of 12 feathers, short and rounded. Legs very long and slender, the bare portion of tibia $\frac{3}{4}$ the length of tarsus; hind toe wanting; anterior toes short and connected at the base by a web, that between the outer and middle being considerably developed.

HIMANTOPUS CANDIDUS.

(THE COMMON STILT.)

Himantopus candidus, Bonnat. Tabl. Encycl. et Méthod. Orn. i. p. 24 (1791); Gould, B. of Eur. iv. pl. 280 (1837); Blyth, Cat. B. Mus. A. S. B. p. 264 (1849); Kelaart, Prodromus, Cat. p. 134 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Schlegel, Mus. P.-B. *Scolopaces*, p. 105 (1864); Jerdon, B. of Ind. iii. p. 705 (1864); Layard, B. of South Afr. no. 618 (1867); Swinhoe, P. Z. S. 1871, p. 405; Shelley, B. of Egypt, p. 260 (1872); Legge, P. Z. S. 1875, p. 376; Irby, B. of Gibraltar, p. 164 (1875); Dresser, B. of Eur. pt. 63, 64 (1877); David & Oust. Ois. de la Chine, p. 462

(1877); Hume, Str. Feath. (B. of Tenass.), 1878, p. 464; Ball, ibid. 1878, vii. p. 229; Cripps, *t.c.* p. 304; Hume, ibid. 1879, viii. (List Ind. B.) p. 113.

Himantopus intermedius, Blyth, Cat. B. Mus. A. S. B. p. 265 (1849, old bird); Hume, Str. Feath. 1873, p. 248; Adam, ibid. 1874, p. 339; Hume, ibid. 1875, p. 183; Legge, *t. c.* p. 363; Butler & Hume, ibid. 1876, p. 18; Scully, *t. c.* p. 190; Hume, Nests and Eggs, iii. p. 589 (1875).

Himantopus autumnalis (Hasselq.), Holdsw. P. Z. S. 1872, p. 475; Legge, Ibis, 1875, p. 403; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1177 (1874); Walden, Trans. Zool. Soc. 1875, ix. p. 228.

Échasse, Buffon, Pl. Enl. 873; *Long-legged Plover*, Lath.; *Black-winged Stilt*; *schwarzflüglicher Stelzenläufer*, German; *Ziguiñuela*, Spanish (Saunders); *The long-legged Avocet*, Kelaart; "*Long legs*," "*Water-Pigeon*," *Stit-Plover*, Europeans in north of Ceylon. *Kakhshal pachak*, Turki (Scully); *Parile-kali*, Ceylonese Tamils.

Adult male and female (Ceylon). Length 13·3 to 15·1 inches; wing 9·0 to 9·3; tail 3·0 to 3·25; tarsus 4·7 to 5·3; tibia (bare) 2·9 to 3·8; middle toe and claw 1·7 to 1·8; bill at front 2·6 to 2·7, to gape 2·7 to 3·0.

Iris scarlet or lake-red; bill black, sometimes with the extreme tip white; legs and feet (variable) lake-red or pink-red; claws black.

Head, hind neck down to the shoulders, back, rump, upper tail-coverts, entire under surface, axillary plume, and beneath the humerus white, the occiput and nape more or less mingled with iron-grey, caused by the dark bases of the feathers in these parts showing on the surface; anterior margin of the eye dark; interscapular region, scapulars, and wings glossy green-black; tail usually pale greyish white, in some quite white; under surface of wing coal-black.

Young. The chick, when leaving the nest, has the bill blackish; legs and feet greenish olive. Head and nape black, mottled with ochraceous; upper part of hind neck, forehead, and all beneath white; lower hind neck, interscapular region, and wings dark olivaceous green, tipped fulvous; back buff, with velvety-black bars; tail barred black and buff.

In the first stage of plumage, during the months of August and September in Ceylon, the iris is salmon-red with dark mottlings; bill blackish olive, paler at the base of upper mandible, and reddish at the base beneath; tibia and front of tarsi brownish yellow; the joints bluish grey; feet and sides of tarsi brownish.

Forehead, face, throat, sides of neck and all beneath, back, rump, and upper tail-coverts white, the latter grey near the tip, with fulvous tips; crown and nape, interscapular region, scapulars, and tertials blackish brown, paling on the hind neck into greyish brown, each feather with a buff-yellow margin; wing-coverts and quills black, with a green gloss, the coverts edged as the back, the secondaries and inner primaries paling to brownish at the extremities, with white tips; tail French grey, darkening towards the tip, which is fulvous.

In the cool season birds of the year have the interscapular region, scapulars, and terminal portion of tertials brown, often margined with greyish; the nape and hind neck sullied with iron-grey, and the tail and tips of the upper tail-coverts French grey; the ear-coverts in some greyish and in others white.

Iris (variable) in some red, in others orange, mottled with deep red; bill dusky reddish at the base beneath.

Obs. Many individuals, after assuming the adult plumage on the back and wings, are found with the crown, nape, and cheeks rather dark brown; the hind neck, at the same time, is uniform mouse-grey. I have seen birds in the autumn with this plumage, which I conceive to be that of the second year; and it is probable that they do not assume the white heads until the third or fourth year. I have found birds breeding with iron-grey heads; and these were evidently not fully aged individuals. There is in most specimens which I have examined a grey appearance about the head and hind neck caused by the dark bases of the feathers; and I have observed the same thing in European examples. The example figured in Dresser's 'Birds of Europe,' and which I have before me, appears to be abnormally dark on the head and hind neck. I have never seen such another; for the parts in question are almost as black as the back. It is a male; wing 9·5 inches. Some valuable measurements of Yarkand specimens are given by Dr. Scully, which I append here for comparison:—"*Males.* Length 14·8 to 15·2 inches; wing 9·6 to 10·2, expanse 28·5 to 31·6; tail 2·9 to 3·3; bare portion of tibia 3·3 to 3·5; tarsus 4·8 to 5·0;

bill to gape 2·7 to 3·0: weight 4·5 oz. to 6·5 oz. *Females.* Length 14·0 to 14·9; wing 9·0 to 9·5, expanse 28·0 to 29·0; tail 3·0 to 3·3; bare portion of tibia 2·5 to 2·8; bill from gape 2·6 to 2·8: weight 5·0 oz. to 5·5 oz."

Other species of Stilt are:—

Himantopus leucocephalus, Gould, which inhabits the Philippines and the Austro-Malayan region, differs in having the whole head, nape, and throat *pure* white, with the hind neck black, taking the form of a longitudinal black band with a sharply-defined transverse edge below the nape, and the same at the lower part of the neck, below which it is white as far as the interscapulars, which, together with the wings, are green-black; the lower parts, back, and tail are white, the centre tail-feathers sullied with greyish. A male (Celebes) measures—wing 9·3 inches, tarsus 4·6, bare tibia 3·0, bill to gape 2·4. At one stage, probably the second year, this species appears to resemble some examples of the Common Stilt in having a greyish hind neck, for Blyth states that he has seen Australian birds which corresponded with Indian specimens of the latter.

Himantopus novæ-zealandiæ, Gould, is entirely sooty black, glossed on the upper surface with green.

H. nigricollis, Vieill., and *H. brasiliensis*, Brehm., are American species, the former inhabiting North, and straying to South, America, and having the hind neck glossy black, as also the head to in front of the eye. The latter, inhabiting South America, has the hind neck black as far as the nape, from which two "horns" of the same colour advance to the eyes. A Valparaiso example in the British Museum measures—wing 9·7 inches, tarsus 4·8, bill to gape 3·7.

Distribution.—The Stilt is found in tolerable abundance in the northern and eastern parts of Ceylon, extending on the latter side to the Hambantota district. It affects the backwaters, tidal lagoons, marshes, and flooded fields in the wet season in the maritime districts, and is also partial to tanks, both large and small, not very far inland, which are surrounded by marshes of moderate extent. In the wet season they move about a good deal, and are found in flooded lands in places where they are never seen in dry weather. They are abundant in the breeding-season at Kanthelai, Minery, and other large marsh-begirt tanks in the northern half of Ceylon; and in the south-east of the island I have met with them in the Wellaway Korale, as well as at their breeding-grounds in the coast-districts. In the Jaffna peninsula they frequent the large lagoon between Ethelemaduvil and Potoor. In the north-east, between Trincomalie and Mullaittivu, they are not common on the salt lagoons, except in the wet season, when they resort to the marshes surrounding these localities. I have not seen any Stilts south of Chilaw on the west coast. At Aripu Mr. Holdsworth says they are common during the rains.

The present species is very abundant in many parts of India, particularly in the north-west; but it appears to be chiefly a cold-weather visitant, the only districts in which it is resident and breeds being the North-west Provinces near Delhi, and the western portion of Jodhpur near the Sambhur Lake. It is decidedly a resident bird in Ceylon; and I do not think that its numbers are much increased in the cool weather, though there may be an influx at that time from the coast of India, and it is therefore all the more strange that it should not be stationary in India. In the Deccan it is a cold-weather visitant, and common in those districts which Messrs. Davidson and Wender collected in. The Rev. Dr. Fairbank records it from Ahmednagar. On the eastern side of the peninsula, further north, it is apparently not so common, for I only find it noted from the Rajmehal hills and Lohardugga, near Calcutta. Mr. Hume remarks that it is noticed in the market about once a week in the cold season. In Furreedpore, Eastern Bengal, it is, says Mr. Cripps, "common in the larger swamps in small batches of eight or ten. By the end of March they commence leaving the district." On the eastern side of the Bay of Bengal its numbers diminish materially. In Pegu a few appear at times, but it is not a common bird (*Oates*); and in Tenasserim it is perhaps rarer still, for, besides being recorded by Captain W. Ramsay from the Karen hills, it has only been rarely observed about the creeks in the tract between the Salween and Sittang (*Hume*). Turning westward again, we find it stated to be common in the Goorgaon district, near Delhi, in Upper India, where there is a "central breeding-haunt." In Jodhpoor it is abundant in the cold season; immense flocks frequent the Sambhur Lake from the commencement of the rains until the beginning of the hot weather; and in September Mr. Adam obtained nestlings there. In February Mr. Hume met with it during the drought in small tanks and pools in other parts of Jodhpoor, and also in the month of February in Oodeypore. In Guzerat it is common in the cold weather, arriving about July; and it occurs, says Capt. Butler, round the edges of the lake at Mt. Aboo. It is likewise common in Cutch and Kattiawar, but less so in Sindh than in Upper India. In Kashgar it is a seasonal visitant, writes Dr. Scully, and breeds there. It arrives in May, and probably

leaves about the end of September, never being seen in winter. "Near Yarkand in summer the birds are found in enormous numbers, frequenting small pools, little lakes, and marshy ground." It breeds throughout Turkestan up to an elevation of 4000 feet (*Severtzoff*). Pallas met with it, according to Jerdon, at "salt lakes in Central Asia." Prjevalsky writes that it "breeds on the Hoang-ho only about small lakes and in marshes. Some birds were observed on the 23rd of April." He considers that the bend of the Hoang-ho forms the northern limit of its distribution, it not having been recorded from Lake Baikal or the Amoor. Eastwards it is found in China, but not so far north as Japan. In the former country it was met with in the Pekin district by Père David. It probably occurs further south, as it has been known to wander to the Philippines, where it was procured in Luzon by Von Martens. Turning westward again, we find it in Palestine and Asia Minor; and in the former country (if not in the latter) it is resident and breeds, according to Canon Tristram. In Europe it is common in the southern portion, frequenting the shores of the Black Sea and the Lower Danube, breeding at Kustendji. It passes through Greece, and arrives in the Epirus in March, April, and May, breeding, according to Lord Lilford, in great numbers further north in Dalmatia. It occurs on passage in the islands of the Mediterranean, but appears to be a winter visitor to Sardinia. It passes through Transylvania in small numbers in the spring, and is occasionally met with at that season in Southern Germany. It has bred in Saxony; but further north it is a straggler, having occurred as high up as Denmark on three occasions only. It has been killed a good many times in England, and has been observed in Scotland near Dumfries, and on the Clyde, as also in Forfarshire and Perthshire. It has strayed as far north as the Orkneys and Shetlands, and has also occurred in Ireland. In Belgium, as also in France, it is a straggler. It breeds in Spain in the marshes of the Coto del Rey, where it was found by Mr. Howard Saunders; and in Portugal it is said to be not uncommon. It is abundant near Gibraltar, and in "the marismas of the Guadalquiver their numbers are," says Col. Irby, "perfectly marvellous." It is migratory to this district, passing north towards the end of March and beginning of April; and though a few remain in the winter, they disappear for the most part in October. Eggs are laid, according to this writer, as early as the 28th of April. In Morocco it is very abundant, particularly at Masharalhaddar. Favier states that it frequents the freshwater lakes south of Tangier, breeding there. A few were met with in this region by Mr. T. Drake. In Algeria it is not uncommon; and it was found nesting at Laghouat by Canon Tristram. In Egypt and Nubia it is very abundant, especially in the Delta. Von Heuglin found it breeding in the latter district, and believes that it nests in Central Egypt, Fayoom, Nubia, and also in the marshes of Kordofan and Sennaar. He did not meet with it on the Upper White Nile, nor in the highlands of Habesh, but found it in all other parts throughout the year, though more common in the winter than in the summer. It extends down the east coast to the Cape, and has been procured on the west coast of Madagascar. It is, however, by way of the West Coast that it chiefly wanders south, for it is recorded from Bengal, Casamanza, and Accra. In this latter place Capt. Shelley met with it. In Gaboon and Benguela Professor B. du Bocage met with it; and in Damara Land it was procured by Mr. Andersson. Layard remarks that up to his time only one specimen had been killed in Cape colony by a Mr. Dumbleton, who obtained it on the Cape flats, where a pair only were seen.

Habits.—The extremely long legs with which this handsome bird is furnished enables it to wade in water where other species could not; and it consequently has a partiality for flooded marshes and swampy land, the edges of shallow, though not weedy tanks, and such like, where it may be seen stalking about, sometimes in comparatively deep water, every now and then thrusting its bill into it and picking up some minute crustacean or aquatic insect. The body is held erect, the neck slightly drawn back, and the bill nearly horizontal when it is walking. It associates in small flocks of a dozen or more, the members of which feed in scattered company, but form at once a compact body when the flock is put on the wing; the flight is performed with quick, regular beatings of the wings, and is not very swift, though steady and straight-on-end; the long red legs are carried straight out behind and at full extent. In the breeding-season it is very watchful and extremely noisy. Long before the intruder is near the breeding-ground he is sure to be made aware of the presence of these Stilts by their rising up in the air and hovering or supporting themselves with quick flapping of the wings, progressing slowly forward over the ground containing their eggs and young;

after remaining in this position for perhaps five minutes they start off and take wide circles, screaming all the while until they return again and hover over their nests. Their note is a harsh but not unmusical monosyllable quickly repeated; and, as Layard remarks, when a number utter it together the effect is not unpleasant. The young birds as soon as they are able to fly about adopt the same tactics as their parents, and have just the same note as they fly round the breeding-grounds. The sound may perhaps be best rendered by the words *gnrnēet, gnrnēet, gnrnēet,* uttered in a brassy tone. I have found the diet of this species to consist largely of small shells, particularly a tiny univalve, numbers of which I have detected in a perfect state in the stomachs of specimens, mixed with minute crustaceans and very small insects. Von Heuglin, who notices the sedate manner in which the Stilt stalks about, says it catches flies and beetles quite as well as small fish, with which he has found the stomachs of some crammed. They are hard-lived birds, and, considering their comparatively weak frame, are somewhat difficult to kill, unless hit in the neck. I have known one fly a considerable distance badly wounded before it fell. Out of the breeding-season they are rather shy; but on the nesting-grounds they will fly round and round the intruder's head, displaying but little fear in their anxiety for the safety of their young. Pallas notices a singular habit which he observed in Central Asia, where they were to be seen dancing together, jumping up with expanded wings.

Nidification.—In the Hambantota district, where large numbers of these birds breed on the dried-up flats of the leways during the salt-gathering season, the nesting-time is in June and July, at the end of which former month I have found nestlings. On the occasion I refer to, when the young chicks were pursued they took to the water from a little embankment covered with weed, which ran out into the lake, and swam like ducklings; on the ground they ran with extraordinary swiftness, and it was with the greatest difficulty that I could catch one, so adroitly did it dart hither and thither as I put out my hand to seize it. The nest is usually made in a hole scooped in the ground, or in a little natural hollow about six inches in diameter, and the lining depends on the materials nearest at hand. At Hambantota a nest made on the flat foreshore of the lake was lined with small pieces of shells. At Minery Lake a nest situated on meadow-land, about 50 yards from the water, was entirely constructed of dry lichens, with which the grass was mixed, and which, in the wet season, flourished beneath the water. It was rather a deep cup, and contained the usual four eggs. This nest was found on the 10th of July. At Kanthelai, where there was, in 1874, a large breeding-colony of these birds, the nests were all found on an island which was, in the dry season, joined to the main-land. Many nests were built in a circle of flood-wreck, with which the highest part was surrounded, and were composed of the dry weeds, grass-bents, rubbish, &c. of which the "wreck" consisted: some were among scanty grass on the shingly ground, and had no lining save the gravel of which the soil was composed; others were among the outcropping edges of a stratum of rock, and were made entirely of sticks, mixed with a few grass-stalks; some, again, were on the flat land, and made of small twigs gathered from the flood-wreck. Long before we reached the place the Stilts came out to meet us, as is their custom, clamouring round our heads with loud cries, and continued this flying backwards and forwards until we reached the egg-ground, when they mostly all flew off, and settling at the edge of the water began to feed. The eggs in the large series I took on this occasion varied much in size, shape, and markings. The usual shape is pyriform, the obtuse end being nicely rounded; but many were flattened at that end, and others the same at the small part. The largest egg found measured 1·96 by 1·29 inch, and was of a dark stone-colour, covered with large hieroglyphic-like blotches and streaks and a few light brown irregular lines. In the same nest was a very small egg of the same character, measuring only 1·59 by 1·28 inch, and very flat at the obtuse end. The prevalent colour was an ochraceous stone tint, the eggs of this type being marked with irregular-edged blotches of blackish sepia, generally more or less confluent at the large end, and mixed with a few underlying marks of a paler tint. Others are stone-yellow, openly blotched, the markings being not so jagged at the edges. Others are quite green, covered throughout with small blots and markings. Some of the stone-yellow eggs were marked with a few large blotches or clouds of blackish sepia. The number varied from three to four in each nest, and they were generally found placed with the small ends together. The variation in size was from 1·96 to 1·32 inch in length by from 1·29 to 1·17 in breadth.

In India the breeding-habits of the Black-winged Stilt are somewhat different. The season there is

from April to June; and the only localities where they are known to breed are the salt-works in the Goorgaon district near Delhi, a locality called Toomulgoodinn near Secunderabad, and the salt lake of Sambhur. Mr. Hume says "they collect together small pieces of *kunker*, or the broken lime lining of the pans, into a circular platform, from 7 to even 12 inches in diameter, and from 2 to 3 inches in height; on this, again, they place a little dry grass, on which they usually lay four eggs." These nests are situated on small strips of ground from a foot to five or six in width, which divide the salt-pans or collecting-spaces from one another, and they are placed close together, as many as twenty-seven being found in one strip 100 feet long. "So accustomed," writes the author in question, "were the birds to the workmen walking up and down the middle of this strip that many of the birds never moved, though we passed within inches of them; and those that did move merely stalked leisurely a few paces away into the salt-pans on either side." The eggs varied as much as they do in Ceylon, and the average of a large series was 1·64 by 1·21 inch.

Eggs of this species, which I have examined in Mr. Dresser's collection, and which were taken in Europe, are similar in marking to mine—ochreous stone and olivaceous stone in ground-colour, and handsomely marked with blackish sepia, taking, in some specimens, the form of large handsome blotches, and in others of smaller, rather streaky-edged spottings. Dimensions as follows:—1·72 by 1·28 inch; 1·71 by 1·26; 1·74 by 1·25.

Genus RECURVIROSTRA.

Bill long, slender, hard, curved upwards to the tip, which is very thin and pointed; both mandibles channelled. Nostrils linear. Wings long and pointed. Tail rather short. Legs long and slender; tibia bare much above the knee; anterior toes united by a moderately-developed web, which is notched in the centre; hind toe minute, but perfect and with a claw.

RECURVIROSTRA AVOCETTA.

(THE COMMON AVOCET.)

Recurvirostra avocetta, Linn. Syst. Nat. i. p. 256 (1766); Gould, B. of Eur. iv. pl. 368 (1837); Blyth, Cat. B. Mus. A. S. B. p. 265 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 265; Jerdon, B. of Ind. iii. p. 706; Schelgel, Mus. P.-B. *Scolopaces*, p. 105 (1864); Layard, B. of S. Africa, no. 617 (1867); Swinhoe, P. Z. S. 1871, p. 405; Holdsw. P. Z. S. 1872, p. 475; Shelley, B. of Egypt, p. 260 (1872); Hume, Str. Feath. 1873, p. 248; Adam, *t. c.* p. 397; Gould, B. of Gt. Brit. iv. pl. 53; Harting, Ibis, 1874, p. 245; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1175 (1874); Dresser, B. of Europe, pt. 46 (1875); Irby, B. of Gibraltar, p. 164 (1875); Blanford, Zool. Persia, p. 286 (1876); Butler & Hume, Str. Feath. 1876, p. 18; David & Oustalet, Ois. de la Chine, p. 461 (1877); Blakiston & Pryer, Ibis, 1878, p. 220; Hume, Str. Feath. 1878, vii. p. 289; id. ibid. 1879, viii. p. 113 (List of Ind. B.).

Recurvirostra europæa, Dumont, Dict. des Sc. Nat. iii. p. 339 (1816).

Recurvirostra tephroleuca, Vieillot, Enc. Méth. p. 360 (1823).

Recurvirostra sinensis, Swinhoe, Ibis, 1867, p. 401.

Avocette, Brisson; *Scoping Avocet*, Lath. & Pennant; *Säbelschnäbler*, German; *Boceta*, Spanish (Saunders); *Alfayate*, *Frade*, Portuguese (Smith); *Halebi*, Arabic (Von Heuglin); *Bou-mehet*, Moorish (Favier). *Shilocluvka*, Russians in Central Asia (Prejevalsky); *Kusya chaha*, Bengal. (Jerdon).

Adult male and female (China). Length 18·0 inches; wing 8·7 to 9·2; tail 4·0; tarsus 3·0; middle toe (without claw) 1·5; bill, measured straight from base to tip, 3·2 to 3·5. The larger dimension relates to males.

(Europe: Brit. Mus.) Wing 8·7 inches; tail 4·0; tarsus 3·2; bare tibia 2·8; middle toe 1·5; bill at front (straight) 3·3. Another example has the bill at frout (straight) 3·0.

Iris red or brownish red; bill blackish horn; legs and feet bluish grey; "soles of the feet tinged with buff" (*Harting*).

(Athens.) Plumage white; top of the head, including the lores and upper part of the face, the hind neck, shorter scapulars and an adjacent dorsal patch, lesser and median wing-coverts, tertial feathers, and the primaries, black; this colour descends down the hiud neck in a broad band of half au inch in width. In birds which are not fully adult the central tail-feathers are sullied with brown.

Young. The bill is stated at first to be straight (*Cullen*); but it appears to assume the curved shape after a few days.

Nestling in down. Bill at front 0·68 inch; tarsus 1·12. Dusky grey above, with an irregular band down the centre of the back, and a stripe on each side of the rump; the back also mottled openly with brown; a thin stripe through the lores and behind the eye.

Further stage, back and wings feathered. Head and nape brown; hind neck and back fulvous tawny; scapulars white outwardly; an angular patch of brown ou the interscapulars; the tips of the feathers buff; wing-coverts and tertials brown, margined with buff; secondaries white; primaries black; face and all beneath white. Bill at front 1·75 inch; tarsus 1·75.

Immature birds have the black parts sullied with brown and the central tail-feathers brownish.

Obs. This interesting genus comprises three species besides the present, two of which are peculiar to America, and the third to Australia. *R. americana*, Gmelin, which inhabits North America, south of Hudson's Bay, including California, and extends into Mexico and Central America, is distinguished from the present by having in the summer the head and neck pale sandy red, blending into the white on the chiu and forehead, and below into the

white of the chest and back. In the winter the red parts are pure white, and in the autumn they are said to be grey. An example in the national collection has the wing 8·6 inches.

The other American species forms one of the most interesting cases of isolated habitat among the whole order of Waders. It is the *R. andina* of Messrs. Philippi and Landbeck, and was obtained at the Lake of Paruncota, in the Andes, at an elevation of 16,000 feet, in June 1863, by Herr Frobeen. As regards the head and neck it resembles the species just named in winter plumage, but has the entire wings, mantle, and tail black. The wing is given as measuring 9·6 inches.

R. novæ-hollandiæ, Vieillot, from Australia and New Zealand, has the entire head, throat, and chest rich chestnut-red at all seasons, sharply defined against the white of the breast; the primaries, greater and median coverts, and the inner series of scapular-feathers black. The wing of a specimen in the national collection measures 9·0 inches; tarsus 3·5.

Distribution.—This well-known and widely-dispersed species was obtained many years ago near Jaffna, and is, perhaps, a not unfrequent straggler to Ceylon. Layard, who records its occurrence, says:—"A pair of these birds were shot by my esteemed friend D. Quinton, Esq., at Chundicolom, near Jaffna, on the estuary." I have not heard of its having since been observed in Ceylon; but, as it is only a cool-season visitant to these low latitudes, it may easily escape observation during its sojourn in Ceylon.

In India it is not a numerous bird, but is widely diffused throughout the coast-districts, particularly of the northern part, though it does not seem to extend to the countries beyond the Bay of Bengal, mustering in greatest force in the north-west. About Calcutta, on the Hooghly and Ganges, it occurs yearly, appearing, according to Mr. Hume, in the market generally in March. Col. Tickell met with it on the Hooghly below Calcutta and at the mouths of the Roopnarain; but he states that inland, on the Ganges and its tributaries, nor on the Mahanadi, he never met with it. Jerdon, however, must have met with it in the interior, as he asserts that it frequents the edges of tanks and rivers; and Mr. Hume writes that they are "seen on the banks of rivers and large pieces of water" in Upper India. He met with it in the smaller tanks of the district of Jodhpoor in January 1878, during a drought which had lasted for fifteen months previous to his visit. In the cold season of 1873–74 large flocks visited the Sambhur Lake, although during previous years this had been rare in that district (*Adam*). In Sindh Mr. Hume found it common and associating in large flocks at the inland sheets of water, especially the Muncher Lake. In the Thurr, Pakur, and Cutch districts he states that is comparatively rare; but in the neighbourhood of Deesa it is more common, as he writes that "he once, towards the end of April, saw a flock of fully one hundred on a small village pond, a mere puddle, below one of the bungalows between Deesa and Ahmedabad." In the same locality Capt. Butler records it as occurring "either singly or in small parties." It occurs in Persia, where Mr. Blanford procured it at the Shiraz Lake (4700 feet) in June; here Major St. John met with it, as also at the lake of Dastarjin. In Palestine it is a resident, according to Canon Tristram, but scarce; and in Arabia Mr. J. K. Lord met with it. It breeds, says Severtzoff, in the north-western and north-eastern districts of Turkestan up to an elevation of 1000 feet above the sea. Though it does not extend apparently to the northern parts of Siberia, where it has not been noticed by Messrs. Finsch, Seebohm, or Von Middendorff, nor yet in Amoor Land, it is found, according to Pallas and Radde, in Southern Siberia, Mongolia, and Tartary; and Col. Prjevalsky states that it "is a tolerably common spring migrant to South-east Mongolia, about the end of March, when it principally keeps to the shores of saltwater lakes, in small flocks of five to fifteen individuals. . . . We found it breeding on the Yellow River, and noticed that the first birds arrived in spring in Koko-nor on the 17th of March, where they were not scarce throughout the month." He did not see it in the Ussuri country. Père David likewise says that it breeds sparingly on the banks of the Hoang-ho or Yellow River.

It appears to be rare in Japan; Messrs. Blakiston and Pryer instance its occurrence at Susaki, in Tokio; and Temminck and Schlegel include it in the 'Fauna Japonica.' Swinhoe says that it occurs on the coast of China in winter, extending to Formosa and Hainan. This appears to be the limit of its range in this region, as it is not found in the Philippines nor in the Malay archipelago.

In Europe its habitat lies between lat. 60° and the Mediterranean. It breeds in the north of Germany and in Denmark and Holland, as also in some of the Frisian islands and the adjoining mainland, in which latter district Mr. Durnford met with it nesting in May 1874. It is common in Holland, and used to be so

in England, where it bred, prior to the drainage of the fens and other marsh-land, in Lincolnshire, Norfolk, Kent, and Sussex. It is more than thirty years since its eggs were taken in this country. In Ireland and Scotland it is a straggler, having occurred as far north as Orkney. It breeds in the south-east of Europe, where Dr. Cullen found it nesting in the Dobrudscha; in Macedonia it was observed by Col. Drummond-Hay, and Lord Lilford met with it in Epirus; in Transylvania it has occurred, but very rarely. In Sardinia it is not uncommon in winter; but in North Italy it appears to be seen chiefly in the spring; and in Malta and Gozo Mr. Wright met with it in spring and autumn. In Southern Spain Mr. Saunders found it breeding; but it is not numerous there, either according to this gentleman or Col. Irby, who testifies to its nesting near Seville; he never observed it near Gibraltar, but he gives Favier's assertion that it is a bird of passage in Morocco, occurring in March, April, and May, and on its return in November. Further south Canon Tristram met with it at Tuggurt, south of the Atlas, and on the borders of the Sahara. In Egypt it is a winter visitor, is moderately abundant, and inhabits suitable localities throughout Egypt, Nubia, and Kordofan. Von Heuglin obtained it in Lower Egypt in May, and is of opinion that it may breed in the Nile delta. From Northern Africa it extends down both the east and west coasts of the continent, and finds its way to Cape Colony, where it is tolerably numerous, not a few breeding there, as also in Damara Land, where Mr. Andersson found young birds. It has been observed by Drs. Kirk, Hartlaub, and Livingstone in the Zambesi country; and the two former naturalists assert that it visits Madagascar. Layard (B. of S. Afr.) records it from Zeekoe Bay, Nel's Poort, and Beaufort, in Cape Colony, and writes subsequently in the 'Ibis' that a Mr. Ortlepp found them breeding near Colesberg, and that it had also been met with at Hopetown. In Damara Land, where Mr. Andersson says it is not uncommon at Walvisch Bay, Sandwich Harbour, Angra, &c., it has been found as far inland as Objimbinque and Ondonga. On the west coast higher up it has been met with at the Congo by Tuckey.

Habits.—This elegant and handsome bird frequents mud and sand banks, the shores of tidal rivers, oozy flats round salt lagoons, and backwaters and the borders of muddy tanks and pools in India. It is frequently seen in small parties; but towards the time of passage it congregates in large flocks, and is often very tame, whereas when feeding alone on rivers it is, according to Mr. Hume, just the reverse. It walks in compact troops, so that sometimes as many as a dozen have been killed at one shot. It searches for its food in the wet mud and ooze just left bare with the tide, or in shallow water, and takes up the worms, crustacea, minute mollusca, and aquatic insects, on which it feeds, with a forward and sideward motion of its curiously upturned bill. It is quite evident that it cannot probe the mud with the tip of the bill so very acute and recurved; but, in order to cover as much ground as possible, it shoots it forward and then sweeps it sideways, taking in its food. Mr. Dresser writes, concerning his observations of the American Avocet:—"A flock of, say, ten or a dozen would commence operations in a diagonal line, one rather before the other, exactly like mowers in a field; and they moved slowly onwards, scooping sideways in the water with their recurved bills in regular order, reminding one most forcibly of a gang of mowers. I have several times examined the stomachs of Avocets I have obtained, and never found any thing in them but a mass of stuff mixed up with tiny stones, and could never exactly make out of what it consisted, though it appeared, so far as I could ascertain, to be the remains of minute insects pounded up into an undistinguishable pulp." I gather further, from the observations of Mr. Hume during his visit to Sindh, that they are very active noisy birds, trotting about very rapidly with their whole bill immersed in the water, moving their heads from side to side as they trot along, and reminding one very much in their actions of the Spoonbill." The Avocet not unfrequently takes to the water, little flocks having been seen by different observers floating about as if for amusement or in order to rest themselves. Major Hayes-Lloyd remarks that he has frequently seen them swimming in Kattiawar; and Mr. Dresser writes:—"I have seen a flock feeding in shallow water; and when I have approached rather too close they would wade deeper until they got out of their depth, when they paddled easily across the narrow lagoon and commenced operations again in the shallow water on the other side."

Nidification.—The Avocet breeds in Europe in the months of May and June. In the former month it lays in Spain; and on the 30th of the same Mr. Durnford procured its eggs at Husum, on the coast of

Schleswig Holstein. In some regions it nests in marshes; but in others, such as the Dobrudscha, and apparently also at the Cape, it chooses sandy wastes and shingle, or the dried-up mud on the foreshores of salt lakes and lagoons. From Mr. Harting's interesting article on this species, contained in his valuable and exhaustive notice of the genus ('Ibis,' 1874), I transcribe the following particulars:—"The nest is usually a mere hollow lined with stems, straws, and pieces of caked mud, but is frequently without any lining at all. Dr. Cullen once found some nests made completely of straws and stones built up to the height of 6 or 8 inches. When undisturbed the bird invariably lays four eggs. . . . Notwithstanding that the nest is generally in an exposed situation, it is not very easy to find; for the bird never flies directly to or from it. It always runs crouchingly along the ground, with head bent low, for some little way before it takes flight, and in returning it invariably alights first at some distance, and approaches the nest in the same cautious way that it left it. It is a shy and restless bird, and betrays great uneasiness if its nest is approached or its young molested, often trying to entice the intruder away by feigning lameness or a broken wing."

The eggs are very handsome, varying in ground-colour from a rich stone-buff or clay-yellow to light ochraceous stone: the markings are in general moderately small for the size of the egg, very dark, almost black, and sharp-edged, like blots of ink; they are distributed tolerably well over the whole surface of the egg, and are mixed up with small blots of bluish grey. In a series of sixteen before me, three are marked with small spots and two with large hieroglyphic-like blots, some of which are washed out in parts. In one egg there are a very few large blots of sepia-black, overlying small blots of bluish grey. In size this series varies from 1·85 by 1·38 inch to 2·04 by 1·38; one very broad specimen measures 1·94 by 1·43. In shape they are broad, somewhat pointed ovals, but not pyriform or compressed at the small end. With regard to the method of feeding the young by the parents, Mr. Harting considers it probable that the old birds bring the food "crosswise in their bills, and laying the latter close alongside the open mandibles of the young, allow them to snatch the food sideways from them;" for, as he remarks, owing to the weak attenuated tips of the bills both in the old and young the food could not be held in them, and their peculiar shape would prevent the bill of the parent being thrust into that of the young, as is the case with insectivorous birds.

GRALLÆ.

CHARADRIIDÆ.

Subfam. CHARADRIINÆ.

Bill short and moderately slender; the culmen compressed at the base, and the tip swollen. Wings long; tertials lengthened. Legs moderate and slender; toes moderate, outer and middle connected at the base by a web; hind toe wanting, except in one genus.

Of littoral habit. Mostly of small size, with a change of plumage in the breeding-season.

Genus SQUATAROLA.

Bill straight, stout, thick at the base, terminal third hard, elevated and concave; gonys correspondingly inflated; nostrils linear, lateral, placed in a pronounced groove reaching to the horny tip. Wings long, pointed; the 1st quill the longest. Tail of 12 feathers, short and cuneate. Legs and feet strong; tarsus tolerably short and reticulate; outer toe connected to the middle at the base by a web; *hind toe minute.*

SQUATAROLA HELVETICA.

(THE GREY PLOVER.)

Vanellus helveticus, Brisson, Orn. v. p. 106. no. 4.

Tringa helvetica, Linn. Syst. Nat. i. p. 250 (1766).

Charadrius helveticus, Linn. Syst. Nat. i. p. 250 (1766), ex Brisson.

Charadrius squatarola (L.), Gould, B. of Europe, pl. 302 (1837); Von Middendorff, Sibir. Reise, ii. p. 209 (1853).

Squatarola helvetica (Linn.), Gould, B. of Austr. vi. pl. 12 (1849); Blyth, Cat. B. Mus. A. S. B. p. 262 (1849); Jerdon, B. of Ind. iii. p. 635 (1864); Gould, Handb. B. of Austr. ii. p. 224 (1865); Layard, B. of S. Afr. no. 562 (1867); Sharpe & Dresser, B. of Eur. pt. 6 (1871); Shelley, B. of Egypt, p. 236 (1872); Hume, Str. Feath. 1873, p. 228; id. ibid. 1874, p. 287; Adam, *t. c.* p. 338; Salvadori, Uccelli di Born. p. 313 (1874); Irby, B. of Gibraltar, p. 159 (1875); Walden, Tr. Zool. Soc. 1875, ix. p. 226; Hume, Str. Feath. 1876, p. 11; Scully, *t. c.* p. 184; Armstrong, *t. c.* p. 338; Legge, *t. c.* p. 245 (first record from Ceylon); Seebohm & Harvie Brown, Ibis, 1876, p. 222, pl. v.; Butler, Str. Feath. 1877, p. 222; Hume, ibid. 1878 (B. of Tenass.), p. 455; id. ibid. 1879, viii. (List Ind. B.) p. 112.

Pluvialis varius (Briss.), Schlegel, Mus. P.-B. *Cursores*, p. 53 (1864).

Charadrius varius (Briss.), Von Heuglin, Orn. N.Ost-Afr. ii. p. 1012 (1874).

The Swiss Sandpiper, Latham; *Vanneau-Pluvier*, Buff.; *Grey Sandpiper* of some; *Tarambola*, Portuguese; *de Goudkievit*, Dutch; *Kiebitzregenpfeifer*, German; *Chorlito*, Spanish (Saunders); *Redolin*, Spanish; *Krungi*, Amoor Land (Schrenck). *Chullok*, Turki (Scully); *Burra Batan*, Hind. (Jerdon); *Chilugan*, Java (Horsf.); *Abu hadjar*, Arabic (Von Heuglin).

Adult male and female (Ceylon). Length 12·0 to 12·6 inches; wing 8·0 to 8·5, expanse 26·5; tail 3·2; tarsus 2·0 to 2·1; middle toe and claw 1·37 to 1·4; bill to gape 1·3.

Iris dark brown; bill black; legs and feet dark greyish blue or plumbeous.

Winter plumage (Ceylon). Head, upper surface (with the exception of the tail-coverts), and wings dark glossy brown. the feathers tipped and marginally spotted with white, and the shafts black: on the scapulars and wing-coverts the spots are large and take the form of bars, the intervening spaces being blackish; greater coverts broadly tipped and edged with white; quills and primary-coverts glossy blackish brown, the coverts with broad, and the inner primaries with narrow white tips; the latter white across the centre, and the secondaries mostly white,

washed with brown on the terminal half; shafts of all the quills white, except at the tip; upper tail-coverts and three outer tail-feathers white, with black bars; remainder with alternate brownish-black and greyish-white bars; forehead, above the eye, chin, face, throat, and under surface white, the feathers on the face, fore neck, chest, and flanks with brown centres, narrow on the fore neck and face, and widened on the chest: on the upper flanks the markings take the form of bars, and in front and beneath the eye they are confluent; axillary plume and least under wing-coverts coal-black; lateral under tail-coverts barred with black on their outer webs.

Adult male and female (Europe; England). Length 10·5 to 11·0 inches; wing 7·4 to 7·6; tail 2·6; tarsus 1·7 to 1·8; middle toe and claw 1·35; bill to gape 1·3.

Male in breeding-plumage (May, Sussex). Lores, face, ear-coverts, chin, throat, chest, breast, and flanks coal-black, not passing round the eye, but extending just above the anterior corner (in some specimens the eyelid above is fringed with black); forehead and a broad band passing over the eye and down the border of the black neck to the sides of the chest, abdomen, vent, thighs, and under tail-coverts white, passing on the crown, nape, and hind neck into greyish; the feathers in these parts centred with black; back, rump, and wing-coverts chiefly dull black, the feathers tipped and laterally spotted with whitish grey, the latter markings on the wing-coverts extending towards the shafts and making these parts whiter than the back; primaries brownish black, the greater portion of the inner webs white, and the shafts with a patch of white near the tip; the shorter feathers with a white patch on the outer webs near the tip; secondaries white at the base, darkening into ashy brown on the inner and into blackish brown on the outer webs towards the tip; the elongated tertials ashy brown, indented with black and white at the margins of the outer webs; upper tail-coverts white, with marginal bars of black; tail white, barred with black (the centre feathers broadly) and also obscured with black near the tip, the extremities being white; the lateral under tail-coverts with marginal spots of black, and the white sides of the chest patched scantily with black; axillary plume black; under wing white. In some specimens the white almost predominates over the black on the upper surface. A male from Barcelona (May) exhibits this character, the white tippings and marginal patches being very broad, especially on the back.

Female in breeding-plumage. The black of the throat and under surface of a brownish hue; this is said to be normally the case: a specimen which I have examined, in Mr. Dresser's collection, in May exhibits this character; the dark markings of the upper surface are also brownish black. The black is acquired by a change of the feather, which can be plainly seen in *spring* examples; the alteration in colour commences at the tip and extends up the feather. In specimens I have examined I detect but few, if any, *new* black feathers, as in the next species.

Young, nestling in down (Petchora river, Mus. Seebohm). Top and sides of head, back, wings and rump, and outer side of thighs dull golden yellow, coarsely mottled with dull black; nape, hind neck, a patch on each side of the rump, and under surface dull white; down the centre of the forehead there is a straight stripe, as in the young of *Ch. pluvialis*, and there is a streak above and below the gape, as in *Ch. fulvus*. The chick is intermediate in marking between these two last named; and the conspicuous white hind neck, as well as the large bill and legs, *besides the presence of a hind toe*, would serve to identify it readily; the lower cheek-stripe encircles a white patch below the eye in all three species.

Immature (British Museum; Rocky Mountains). Head, nape, interscapulars, tertials, and wing-coverts blackish brown, palest on the wing-coverts; the feathers of the head margined with dull golden yellow, and those of the remaining parts in question with large marginal spots of the same; back much the same, but the spots less pure; tail barred black and white, the white changing near the tip into golden yellow; upper tail-coverts white, tipped with yellowish. Forehead, face, and throat dull white, streaked with black, which pales and blends with the whitish on the fore neck; sides of the chest marked with blackish brown and faint yellowish; beneath from the chest dull whitish.

Obs. In this plumage the Grey Plover is not unlike the Asiatic Golden Plover; but the yellow spottings are paler, and, to the inexperienced, the larger bill, *conspicuous black axillaries* (seen even in flight), and, *above all, the hind toe* will always serve as distinctive marks.

Distribution.—The Grey Plover has not been noticed in Ceylon until recently. I met with it at Illepekadua on the 10th March, 1876, and recorded its occurrence in 'Stray Feathers,' *loc. cit.* Two days afterwards I saw a small flock at Manaar. Mr. Murray, of the Ceylon Civil Service, subsequently informed me that he had often met with it at Jaffna, and that in some seasons it was tolerably common on the beach

near Batticotta and along the coast of the peninsula. In October 1876 I saw one on the beach at Chilaw, and in the following month I acquired a specimen which was shot by a native at Kotte, near Colombo. The occurrences, therefore, which came under my personal notice fell within a single year; but as they extended over two seasons it is to be inferred that the species may possibly visit the island yearly in small numbers.

In India it has been principally noticed on the coasts of the northern portions of the empire; but Dr. Jerdon obtained it in the Madras market; and as it is one of the most cosmopolitan birds in the world, it is sure to occur all round the peninsular sea-board. It is chiefly a sea-coast species; but I find an instance of its occurrence inland in the Deccan, where the Rev. Dr. Fairbank observed it in flocks in the cold season. Neither Messrs. Ball nor Cripps say any thing of it; but Mr. Hume remarks that a few are seen yearly in the Calcutta market. In the Irrawaddy delta Dr. Armstrong met with it only along the sandy portions of the beach between Elephant Point and China-Bakeer, where it was not uncommon. In Tenasserim it is rare; Captain Wardlaw Ramsay obtained it at Tonghoo, and Dr. Armstrong at Amherst. It is found, but not commonly, at the Andamans, occurring at Macpherson's Straits and at Port Mouat, and was procured by Capt. Wardlaw Ramsay at South Andaman. In the north-west of India Mr. Hume found it abundant in Kurrachee harbour and along the Sindh coast in the cold season; Captain Butler has seen it there during the hot weather, and he likewise remarks that it is abundant at Mandavee in the gulf of Cutch. Inland it only occurs during migration in autumn and spring. A remarkable instance of its occurrence in *September* in full breeding-plumage is noted by Mr. Adam, who obtained such a specimen on the 25th of that month at the Sambhur Lake. This must have been an individual which migrated south before moulting, or one which acquired its nuptial dress after its migratory impulse had died out for that year.

In Turkestan Severtzoff says that it occurs rarely in the south-eastern district up to 1000 feet elevation; and in Kashgar Dr. Scully met with two examples in November, but did not see any thing more of the species. It summers in Northern Asia; but I do not see any record of its having been observed in North-western Siberia nor on the Yenesay. Towards the east, however, Von Middendorff met with it in very high latitudes, and found it breeding in the Byrranga mountains in lat. 74°, and on the Boganida river in lat. 71°; but it was not seen in those northerly regions before the 24th of May. In Amoor Land Von Schrenck met with it; and in Japan it is common, inhabiting also in summer the peninsula of Kamtchatka. It passes down the coast of China in winter, is found in Formosa and Hainan, and extends across to the Philippines, where it has been obtained in Cujo and Negros. Southward in winter it migrates through the Malay islands to New Guinea and the continent of Australia as far as Tasmania. In regard to the first-named region it has been obtained by several naturalists in Java and Borneo; and in Labuan it was procured by Messrs. Mottley and Dillwyn, while recently Governor Ussher brought it home from Brunei river and Moara Island. In Timor, Wallace and Bernstein met with it; and from New Guinea it is recorded by Müller. In Mr. Ramsay's new list of Australian birds it is noted as being found at Rockingham Bay and all the southern colonies, as well as in the Richmond and Clarence-river districts. I do not find it recorded from New Caledonia or any of the islands of the Pacific, so that it does not seem to extend eastward of New Guinea. Returning to the west of Asia and Europe, we find Canon Tristram recording it as a winter resident in Palestine; and Robson as not uncommon in Asia Minor in autumn, a few staying throughout the winter. Lord Lilford procured it in the Epirus; and Lindermayer and Von der Mühle record it from Greece. In Malta, Sicily, and Sardinia it is a winter visitor; and in Spain, according to Mr. Saunders, is more common on passage than in winter; he obtained it in May in breeding-plumage in Malaga. In Portugal it is said to be common. In the Gibraltar district Col. Irby says that it arrives in November, and, though frequently seen in autumn and spring, is not at any time abundant. On the 22nd May he obtained a pair at the mouth of the Guadiarro, the male of which was in full summer plumage, an unusual occurrence so far south. About this time it is passing north through Central European districts to its breeding-home on the Arctic circle. In Transylvania it occurs on migration but rarely; further east it appears to pass through Southern Russia and up the Volga, being noticed in occasional seasons in the Kasan district. From here Messrs. Seebohm and Harvie Brown say that it probably passes down the Petchora to about the mouth of its tributary the Ussa, and then spreads over the vast tundras to the north-east, on which these enterprising naturalists were so fortunate as to take its eggs a few years since. The latter author met with it likewise near Archangel,

but was told by the inhabitants that they did not breed there. There is much yet to be learnt concerning its breeding-home, for we have yet to discover the whereabouts in the nesting-time of those which migrate up the Baltic from Western Europe. Herr Collett asserts that it breeds in the mountains of Finmark; but I am not aware that its eggs have been procured in that country. Mr. Durnford met with Grey Plovers in pairs at Husum and in the island of Sylt at the end of May; but these were, it is to be presumed, on passage.

Leaving the continent of Europe and referring now to its African distribution, I find that, according to Col. Irby, Favier states that it is seen about Tangier from December until March; and Mr. T. Drake likewise records it from Morocco. It has been noticed in Algeria; and in Egypt it is distributed throughout the Delta and north coast in winter; and Von Heuglin says it is found along the coast of the Red Sea and in Kordofan; he observed it as late as April. It extends down both sides of the continent to the Cape of Good Hope, and spreads eastward to Madagascar and the Seychelles, from both of which regions Mr. E. Newton records it. Captain Sperling noticed it as being common at Zanzibar; and in Natal Mr. Ayres procured it. Layard writes that he never saw the Grey Plover in Cape colony in breeding-dress, but that he procured many specimens in winter dress there and along the east coast as far north as $1\frac{1}{2}°$ south. In Damara Land Mr. Andersson obtained it in winter. Further north it has been obtained in Gaboon, as also on the Gold Coast and in Senegambia; and in the Canary Islands it has also occurred.

Its distribution in America is almost as extensive as it is in the Old World, for it is found from Greenland, where it was met with in summer by Reinhardt, down the coast to the West Indies, where it has been obtained in Jamaica, Cuba, Trinidad, and the Bahamas. In Guatemala Mr. Salvin met with it at Chiapam; and in Texas Mr. Dresser procured it in autumn and spring.

Habits.—This most cosmopolitan of all the Plovers is quite a sea-coast species, frequenting sea-beaches, the sandy shores of inlets and river-mouths, tidal flats, and other situations on the immediate sea-board. It associates usually in small troops of six to a dozen, and is often met with singly, consorting then with the Sand-Plovers (*Ægialitis*). Its greater size and its large head and bill will always serve to distinguish it when feeding from the Golden Plover of Ceylon; and when on the wing, passing the observer, its black axillaries forming a conspicuous tuft are at once recognizable, and easily distinguish it from its lesser ally. I found it, on the few occasions on which it came under my observation in Ceylon, a shier bird than the Golden Plover, inclined to be wary and impatient under observation. The specimen I killed at Illipekadua was feeding at a little distance from some Sand-Plovers at the edge of a pool in the tidal flat, and was knocked over at a long shot as it rose and flew round me. Its flight is somewhat heavy; and I noticed that a small troop which passed me in a pour of rain flew slowly and close together, forming a compact flock.

Nidification.—Until lately the breeding-haunts of the Grey Plover remained almost undiscovered; but ornithologists are now indebted to those indefatigable travellers, Messrs. Seebohm and Harvie Brown, for a knowledge of its nidification and an acquaintance with its eggs. These gentlemen found this species breeding in the great tundras lying between the Petchora river and the Ural mountains. Von Middendorff had previously brought eggs from Northern Siberia, but had not published any details concerning its nesting. Nests were found on the Petchora from the 22nd of June to the 12th of July, the places chosen for them being low-lying boggy tracts on the tundra in preference to the higher and more undulating parts of it. They were "simple shallow depressions in the moss or peaty soil, lined with a small handful of broken twigs and leaves of the surrounding plants." Mr. Harvie Brown writes that the bird's behaviour near the nest was similar to that of the Golden Plover, "sitting erect on the higher hummocks, running rapidly across the hollows, whistling at intervals, then flying in a wide circle round the nest—not, like the more cautious Dotterel, running round the hummocks or grey stones, pausing in the hollows, silent, running over a ridge out of sight, head down, and reappearing from a diametrically opposite direction." Concerning the bird's voice and other habits during the breeding-time, we learn that the notes are "three in number:—*first,* the call-note between male and female, a double whistle, the first syllable short, the second drawn out; second, the alarm-note, a single plaintive whistle, about half a note higher than that of a Golden Plover; and, *third,* a treble

whistle, the second syllable having a lower intonation than the first and third. This latter is not so commonly used, and appears to be the call-note of the males to one another when flying apart from the females, and is generally uttered when the birds are flying high in the air. The males associate in small parties of three and four; and a peculiar phase of flight is then observable. They rise to a great height and dash about in erratic curves, or diving down impetuously, rapidly rise again; they then remain almost stationary like a Temminck's Stint, raising the wings over the back until they nearly meet, and finally, flying with long Tern-like sweeps of the wings, utter their musical treble note." A fine series of eggs in the collection of Mr. Seebohm, which I have examined, vary in ground-colour, being olive stone, greyish stone, and yellowish stone-colour, the grey eggs having the smallest markings. They are blotched and clouded boldly on the larger half, and chiefly round the end, with irregular-edged blotches of blackish sepia, running mostly in a longitudinal direction; the markings are smaller near the minor end, and beneath the dark colouring are smears and traces of bluish grey. In shape some are rather pointed and others slightly rounded at the small end. They vary in length from 2·15 to 1·96 inch, by from 1·42 to 1·41 respectively in breadth.

Genus CHARADRIUS.

Bill much as in *Squatarola*, tip not so elevated, and gonys less pronounced. Wings and tail as in that genus. Legs and feet moderate; toes furnished with a narrow lateral membrane, as in the last; outer toe united at the base to the middle; hind toe wanting; claws straight and concave.

CHARADRIUS FULVUS.

(THE ASIATIC GOLDEN PLOVER.)

Charadrius fulvus, Gmel. Syst. Nat. i. p. 687 (1788); Sharpe & Dresser, B. of Eur. pt. 9 (1871); Swinhoe, P. Z. S. 1871, p. 403; Holdsw. P. Z. S. 1872, p. 470; Hume, Str. Feath. 1873, pp. 228, 462, et 1874, p. 287, et 1875, p. 179, et 1876, p. 463, et 1878 (B. of Tenass.), p. 455, et 1878, vii. p. 482, et 1879 (List B. of Ind.), p. 112; Buller, B. of New Zealand, p. 202 (1873); Legge, Ibis, 1874, p. 27, et 1875, p. 400; Salvadori, Ucc. di Born. p. 313 (1874); Hume, Nests and Eggs, iii. p. 570 (1875); Butler & Hume, Str. Feath. 1876, p. 11; Armstrong, *t. c.* p. 339; Ball, ibid. 1878, vii. p. 226; Seebohm, Ibis, 1879, p. 153.

Charadrius xanthocheilus, Wagler, Gould, B. of Austr. vi. pl. 13 (1848).

Charadrius longipes, Temm. apud Bonap. Rev. Crit. p. 180 (1850); Jerdon, B. of Ind. iii. p. 636 (1864).

Charadrius pluvialis, Linn., Sykes, P. Z. S. 1832, p. 166.

Charadrius virginicus, Bechst., Blyth, Cat. B. Mus. A. S. B. p. 262 (1849); Kelaart, Prodromus, Cat. p. 132 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 109.

The Marbled Plover, Kelaart; *Chnipe*, Dutch in Ceylon; *Sneppy*, Portuguese in Ceylon; *Trull*, Java (Horsf.); *Cheruling*, Sumatra (Raffles); *Sintar*, Borneo (Mottley); *Kotan*, Tamils in Ceylon; *Chota battan*, Hind. (Jerdon).

Rana watuwa, also *Oliya*, *Maha oliya*, Sinhalese.

Adult male and female (Ceylon). Length 9·3 to 10·0 inches; wing 6·2 to 6·75; tail 2·3 to 2·6; tarsus 1·6 to 1·85; middle toe and claw 1·2 to 1·25; bill to gape 1·05 to 1·1.

Male (Eastern Bengal). "Wing 6·8 inches; tarsus 1·66; weight 4·87 oz." (*Cripps.*)

Winter plumage (Ceylon). Iris dark brown; bill blackish, gape and base beneath yellowish, in some blackish leaden with the entire base pale; eyelid olive-brown; legs and feet plumbeous, varying in depth of colour.

Top of the head, back, rump, and longer scapulars dull black, paling on the hind neck, wing-coverts, and tail to brown, the greater coverts being lighter than the rest; the feathers of the head have broad lateral margins of golden yellow, and those of the back, rump, and scapulars lateral and double terminal spots of the same; the paler portions are similarly spotted with a lighter hue, those on the wing-coverts and tail being whitish; greater coverts and lateral tail-feathers tipped and edged with white; quills blackish brown, narrowly tipped, as are the primary-coverts, with white; the central portion of the shafts white; forehead, face, and throat whitish, paling into pure white on the breast and belly; the face, fore neck, and chest with dark centres to the feathers, and the flanks barred with the same hue; on the chest the brown centres are broadest, imparting a dark appearance to it; *axillary plume dark grey*; lateral under tail-coverts with brown marginal spots.

Breeding-plumage (Yenesay river). Wing 6·3 inches; tarsus 1·7; bill to gape 1·1. Under surface from the vent to the chin black, covering the ear-coverts and entire face, and passing round the eye and over the lores across the base of the forehead for about $\frac{1}{20}$ inch from the bill; flank-feathers white, barred with black, and the upper series, next the chest, tinged in places with yellow; the head, occiput, back, and scapulars blacker than in winter plumage, and the spottings of a brighter golden yellow, and many of the tips of the feathers whitish; across the forehead, just above the black, is a broad band of white, passing over the eye and above the ear-coverts down the side of the neck to the flanks; the dark portions of the wing-coverts and tertials are black and the markings yellower than in winter; under tail-coverts white, the shorter feathers patched with black, and the lateral feathers

barred with it on the outer webs; the primaries are scarcely any blacker than in winter, but the shafts at the base are much darker, and there is less white towards the tips.

The markings in some specimens are much more golden than in others; but the specimen above described has the upper-surface feathers tipped with white in an exceptional manner.

The summer dress begins to be assumed in Ceylon about the middle of April, and before the birds have left the island they may be procured in every stage of change almost to the complete black plumage. A male shot at Galle on April 29, 1871, has the face and under surface nearly uniform black, a few of the feathers on the upper part of the throat, and here and there on the breast, being parti-coloured; the white band on the forehead and down the sides of the neck is fully developed, and all the upper-surface markings bright golden yellow.

The breast is the first part to change, and becomes tolerably black before the black face and throat and the white forehead are assumed. As I remarked in the 'Ibis' for 1874, the black under plumage is assumed, to a considerable extent, by a change of colour in the feather; black marginal spots appear near the tips of the breast-feathers, and quickly coalesce until the terminal half, all but the extreme tip, becomes black; the white margin then turns; these feathers may be distinguished from the new-moulted feathers, which are entirely black, and of course encased in the usual manner at the shaft.

Young, nestling in down (Yenesay river, July 22, 1877: mus. Seebohm). Above mixed velvety black, golden yellow, and white; the black markings in the form of bold blotches and conspicuous mottlings; forehead and lores white, with a cross-shaped black mark; an irregular band of white across the hind neck, joining the white throat and fore neck; above and below the gape there is a black line running back to the ear-coverts; under surface greyish white. Tarsus 1·4 inch, bill to gape 0·8; bill black; legs and feet wood-brown.

The first plumage is very similar to the adult winter dress; but the spots on the upper surface are smaller and less bright, and the under surface is sullied with grey; the ground-colour of the head and back is not so dark as in the adult.

Obs. This species was first confounded with the European bird *C. pluvialis*, and was afterwards thought to be the same as the American race *C. virginicus*. It afterwards received a title of Temminck's, applied to it by Bonaparte, and was finally demonstrated to be the same as the Malasian and Australian species, *C. fulvus*.

It differs notably from *C. pluvialis* in having the axillary plume and under wing *grey* instead of pure white, in having longer legs and a proportionately larger bill. The European bird has also a different character of marking on the upper surface, more easily understood at a glance than from description on paper. A specimen in breeding-plumage from the Yenesay, shot by Mr. Seebohm, has a greater number of marginal yellow spots on the upper-surface feathers than are present in the Asiatic race, and the tertials are marked with regular oblique marginal *bands* instead of *spots* as in our bird; the black frontal band is slightly broader; the bands of the central tail-feathers are yellower and more complete than in our bird.

The nestling *C. pluvialis* is quite differently coloured, being *finely* mottled with golden yellow and black on the upper surface, without the nuchal white band; the forehead is without the cross-shaped mark, and the cheeks are mixed brown and yellow. Tarsus 1·2 inch; bill to gape 0·62. In these measurements even the chick is well marked.

C. virginicus has the axillaries dark grey, as in *C. fulvus*, but is larger.

Distribution.—The Asiatic Golden Plover arrives in Ceylon in great numbers in the month of October; but in some seasons considerable flocks reach the island nearly a month earlier. I have met with it in the south of Ceylon near Wackwella as early as the 10th of September. In 1875 they first made their appearanee at Trincomalie about the 5th of October, at which time they were to be seen frequenting isolated roeks in the harbour and about the sea-coast, previous to overspreading the interior. In a few days they disappeared from these marine loealities, and took up their usual habitat in open places along the sea-board and inland swamps and fields. Mr. Holdsworth remarks that they arrive in the Manaar district (Aripu) in August, many of them still wearing traees of their summer dress; and this I have noticed in September specimens at Galle. During the season of its sojourn in Ceylon it wanders about a good deal in wet weather, appearing in places after a heavy night's rain in November, December, and January where it is never seen in dry weather. On such occasions it makes its appearance in publie places near the sea, sueh as the Galle face at Colombo, and the esplanades at Galle, Jaffna, and Trincomalie. I have met with it in suitable localities in all parts of the northern, north-eastern, and north-western districts which I have visited; and the same may be said of the low country in the west and south of the island. It is very abundant between Waekwella and Baddegama,

frequenting the open cultivated district on each side of the Gindura river. In the south-east of the island it is met with numerously about the leways, near estuaries and salt lagoons; and on the east coast and to the north of Trincomalie finds a home in similar localities. I noticed it in abundance in March in the Jaffna peninsula, and met with it in great numbers all down the north-west coast, from Jaffna to the Puttalam district. It frequented the flats on the sea-coast, and consorted much with the Turnstone in some localities, such as the Erinativoe Islands and the Manaar sands, being particularly abundant in those places. It ascends the hills from the Eastern province, having been met with on the Uva patnas near Banderawella, at an elevation of 4000 feet; and it is not improbable that it occurs as a straggler about the Nuwara-Eliya lake. It leaves the island early in May, and on the 28th of April I have shot it at Wackwella in almost perfect breeding-plumage.

In India it is found principally in the north-east, appearing to be rare both inland, on the Deccan, and in the north-western districts. It has been recorded by Mr. Blanford from Bombay; but the Rev. Dr. Fairbank did not meet with it in the Khandala district. In Kattiawar it is abundant; but in Sindh, Guzerat, and Jodhpur it is rare. In the former province Mr. Day met with it at Larkhana, and in the second-named Captain Butler met with it singly or in small parties, and did not observe it until October, so that it must extend across the country from Bengal, and not migrate direct from the north; and this is proved by the fact that Mr. Blanford did not notice it in Persia (though it has been seen on the Mekran coast), nor Severtzoff in Turkestan. Dr. Stoliczka observed it during the first half of the winter at Yarkand; but Dr. Scully did not see it at all. Its habitat, therefore, beyond the north-west of India is very limited. In Raipur it is said to be very abundant in stony plains, leaving them about the 1st of May; and Mr. Ball likewise records it from Orissa on the north and south of the Mahanadi river, and also from the Godaveri valley. Writing of it in regard to the Calcutta district, Mr. Hume says that in the beginning and end of the cold season they are brought into the market in "enormous numbers, and that on the 26th April they were all in breeding-plumage; about the 16th May they all disappear." Mr. Cripps, who says that it is very common in Furreedpore, has noticed it as early as the 10th August and as late as the 10th of May. In the Irrawaddy delta it was found by Dr. Armstrong to be common along the shore, but more abundant inland in ploughed fields. In Tenasserim it is common, and is found on the open and cultivated-plain portions of the entire province; it leaves, says Mr. Davison, in May. Regarding the Andamans, Mr. Hume procured it at Preparis and Cocos, and saw it at many of the other islands. Mr. Davison found it abundant in South Andaman and on Camorta in the Nicobars: he remarks that it arrives in November and remains until June; but stragglers are procured in the hot season in non-breeding plumage, these being evidently barren birds. On the opposite side of the peninsula it was met with at nearly all the islands of the Laccadive group.

It wanders south by way of the Malay peninsula and the coast of China (from which latter region and from the islands of Hainan and Formosa Swinhoe records it) to the Malay islands, and thence onwards to Australia; while to the east it spreads beyond the Philippines, where it has been obtained in Luzon, Negros, Mindanao, and Zebu (in the latter in full breeding-plumage in April), to the Pelew and other islands of the Pacific, among which may be mentioned Eua and Ninafou in the Friendly group, and Ponape, one of the Seniavins, whence it has been recently received by Dr. Finsch. Layard has procured it in New Caledonia, and writes ('Ibis,' 1879, p. 107) that his son found it breeding on some islands off Ansevata, which important information demonstrates that it is, in some degree, resident in the southern hemisphere. It has been found in more tropical latitudes in summer than the above mentioned, as Dr. Meyer procured it in the Togian Islands in 1871; and in Formosa Swinhoe states that it breeds in great numbers. The eggs, however, which he obtained in that island as belonging to the Golden Plover appear to be those of the Large Sand-Plover. It occurs in Sumatra (where Mr. Everett obtained it in the Lampong district), in Java, Borneo, Labuan, Celebes, Bouru, Amboyna, Ceram, Batchian, Halmahera, Morotai, and Timor. In Borneo it is, according to Mr. Mottley, very common; and it is recorded from numerous localities. It was procured by Forster in Celebes; and Herr Müller obtained it in New Guinea, from the south coast of which island Mr. Ramsay of Sydney likewise records it. He likewise notes it as having occurred at Cape York, Port Darwin, the Gulf of Carpentaria, Rockingham Bay; whilst, as regards Australia generally, Mr. Gould observes, "Although nowhere very abundant, this bird is generally dispersed over all the colonies from Tasmania to the extreme north of the continent of Australia. . . . . . I obtained several specimens on the banks of the Derwent in

Tasmania, observed it in small numbers on the flats below Clarence Plains, and also killed examples on one of the islands in Bass's Straits." In New Zealand, Mr. Buller says that it occurs occasionally as a straggler, and always in winter plumage.

Returning now to Central Asia, through which it evidently migrates from India to Northern Siberia, passing from the south by Assam and Thibet, we find that celebrated traveller Col. Prjevalsky writing as follows of it:—"In the beginning of May 1871 we noticed large numbers of this species during migration in S.E. Mongolia, close to Si-ins; they kept in large flocks about the newly-ploughed fields. In the following year we again met with some, on the 24th of April, in the Hoang-ho valley, but found them rather scarce. In autumn only a small flock was observed by us, in the beginning of September, in Northern Ala-shan; but, according to the statements of the missionaries, these birds are just as common about Si-ins in autumn as they are in spring. It does not inhabit Kan-su or Koko-nor; and only a few migrating specimens pass over Lake Hanka, about the end of August." On the Amoor specimens were procured by Von Schrenck of a Plover which, judging by the length of the tarsus, must have belonged to this species. In Japan it is common throughout the country. It is most likely distributed over most of N.E. Siberia in the breeding-season; Middendorff procured it at Udskoj-Ostrog; and further west Mr. Seebohm met with it on the Yenesay first on the 5th of June, and found it plentiful at Koo-ray'-i-ka as it was passing north. It was "extraordinarily common" at Golchecka, and was breeding there. Dr. Finsch does not record it from the river Ob, nor does it inhabit, properly speaking, the south-eastern portion of the continent, although it is not improbable that stray birds, wandering westward of their regular habitat, in company with the closely-allied European species, may occasionally turn up in Asia Minor or Palestine. Through these countries individuals led astray in this manner have perhaps passed, or, if not, they have gone westward through Europe along with other Asiatic species from more northerly latitudes; for, singular to say, the species has been obtained in Heligoland by Herr Gätke; and a few years ago Mr. Dresser detected a specimen in Leadenhall Market, which had been sent from Holland with the common Golden Plover.

Habits.—When the Asiatic Golden Plover arrives first in Ceylon it is very tame, and can easily be walked up to and shot; and if perched on a rock in the water it will allow a boat to pass close to it without rising. After a short period it gets wilder, but is never very shy. It is very fond of bare fields, and is usually found in flocks of a dozen to thirty or forty, which extend themselves over a considerable extent of ground, and run hither and thither independently of one another, every now and then making a spasmodic sort of peck at some insect which its large eye catches sight of, and then resuming its bolt-upright position. I have seen vast flocks of it on the ooze in the north-west of Ceylon; but where these were assembled small flocks were likewise to be seen on the grassy land on the shore. As above mentioned, its movements are greatly affected by rain, after which it appears in many localities where at other times it is never seen. During wet weather in November or December a few are often to be found on the Galle face at Colombo, and likewise on the esplanade at Trincomalie, in both of which places they are almost always in company with the Mongolian Sand-Plover, and do not appear to be nearly so shy as when met with on the sea-coast. It is its habit to run slowly when walked up to, and then stand perfectly still, with its body turned away from the observer and head on one side; and in this position it remains till approached within shot of, or nearly so, when it suddenly stretches out its wings, and, after taking one or two quick strides, flies off along the ground with no great speed. When a flock are on the wing, having been disturbed on the sea-shore, with perhaps a number of other shore-birds, they fly very quickly, sometimes rising and falling in their course, and shooting down near the earth with the rapidity of an arrow, as they hurry off to some new feeding-ground at a distance from the intruder. In general they are much more silent than the Golden Plover of Europe; and I am only acquainted with their ordinary note of alarm, which is one of two syllables, like *til-wee.* Mr. Seebohm, who heard it during the breeding-season in Northern Siberia, says that its voice there exactly resembles that of the Grey Plover, which I have noticed in my last article; and he noticed all three variations, the third, however, being much more frequently uttered by it than by the Grey Plover. In Ceylon I have found the food of this species to be insects of various kinds, worms, and slugs.

In Borneo, where the species is very common in the cool season, Mr. Mottley says they fly "in large flocks, especially frequenting the bare muddy places where buffaloes are in the habit of bathing; they are difficult,"

he writes, "to approach, except in a high wind, when they are very tame; and a large number may be shot at once as they rise. When disturbed they usually perch in some bare, stony spot."

Nidification.—Mr. Seebohm found this Golden Plover breeding on the Yenesay, in lat. $69\frac{1}{2}°$, in the early part of July, and took its eggs on the 13th of that month. It nests on the wide-spreading tundras of that region, which are covered chiefly with moss and lichen, "sprinkled with patches of bare pebbly ground, and interspersed with hummocky plains, where ground-fruits and gay flowers were growing." The nest was a "mere hollow in the ground upon a piece of turfy land, overgrown with moss and lichen, and was lined with broken stalks of reindeer moss."

In a series of two clutches of four before me, the only eggs extant of this species, and for an examination of which I am indebted to my friend Mr. Seebohm, one set are light clay-buff and the other very pale buff with an exceedingly faint greenish tinge in them. The former are richly marked with dark sepia, in the form of large straggly-edged blotches collected in a tolerably well-marked ring round the large end, with numerous large blotches extending quite round the small end; one specimen is characterized by not a few streaky marks and short lines, chiefly at the small end. The pale clutch are marked with sepia-black clouds at the large end, and the same very dark blots towards the small end, under which are a few specks of bluish grey. In shape they are pyriform, but not much compressed at the point; the obtuse ends are rather flattened. The first clutch vary in size from 1·89 to 1·91 inch, by from 1·27 to 1·28; the second from 1·89 to 1·92, by from 1·27 to 1·32.

Genus ÆGIALITIS.

Bill as in *Charadrius*, varying in robustness. Wings long, reaching to the end of the tail, with the tertials nearly equal to the primaries. Tail short and cuneate. Legs and feet slender; the tarsus longer in proportion to the toes than in the last; hind toe wanting.

Of small size, but stout form. The change to summer plumage chiefly in the head and neck.

ÆGIALITIS GEOFFROYI.

(THE LARGE SAND-PLOVER.)

Charadrius asiaticus, Horsf. Tr. Linn. Soc. xiii. p. 187 (1821).

Charadrius geoffroyi, Wagl. Syst. Av. fol. 4, p. 13 (1827); Schlegel, Mus. P.-B. *Cursores*, p. 39 (1864); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1020 (1873).

Charadrius rufinus, Blyth, Ann. & Mag. Nat. Hist. xii. p. 169 (1843).

Hiaticula geoffroyi, Blyth, Cat. B. Mus. A. S. B. p. 262 (1849).

Ægialites leschenaulti (Less.), Blyth, Ibis, 1867, p. 163.

Ægialitis geoffroyi (Wagl.), Heugl. Syst. Uebers. Vög. N.O.-Afr. p. 56 (1856); Jerdon, B. of Ind. iii. p. 638 (1864); Harting, Ibis, 1870, p. 378; Swinhoe, P. Z. S. 1871, p. 404; Holdsw. P. Z. S. 1872, p. 471; Shelley, B. of Egypt, p. 238 (1872); Walden, Ibis, 1873, p. 316; Legge, Str. Feath. 1873, p. 489; Salvadori, Uccelli di Borneo, p. 318 (1874); Legge, Ibis, 1875, p. 400; Walden, Trans. Zool. Soc. 1875, ix. p. 227; Armstrong, Str. Feath. 1876, p. 339; Hume, *t. c.* p. 463; David & Oust. Ois. de la Chine, p. 426 (1877); Dresser, B. of Eur. pts. 69, 70 (1878); Hume, Str. Feath. 1878 (B. of Tenass.) p. 455; Ball, ibid. 1878, vii. p. 226.

Cirrepidesmus geoffroyi (Wagl.), Hume, Str. Feath. 1873, p. 229, et 1874, p. 288, et 1876, p. 12.

Sandpiper, Europeans. *Kotan*, Tamils in Ceylon.

Oliya, *Ola-watuwa*, Sinhalese.

Adult male and female (Ceylon). Length 8·5 to 9·0 inches; wing 5·5 to 5·7, expanse 17·5; tail 2·2; tarsus 1·5; middle toe and claw 1·0; bill to gape 1·1 to 2·5, at front 0·87 to 0·98.

Winter plumage. Iris brown; bill black, yellowish at the base beneath; tibia and feet slate-bluish or plumbeous, paling to yellowish olive or, in some, fleshy grey.

Head and upper surface with the wings greyish brown, darker on the least wing-coverts and on the face in front of and beneath the eye, all the feathers edged greyish white, most broadly on the wing-coverts and upper tail-coverts; the scapulars and tertials with dark shafts; quills blackish brown, the shafts nearly all white, the central portion of the outer webs of the inner primaries and the tips of the greater coverts white; tips of rectrices and the laterals entirely (with the exception of a brown wash on the inner web) white; forehead and a stripe over the eye to a patch behind it, chin, throat, entire under surface, and under wing pure white; a light brown loral stripe, more or less conspicuous, connects the gape with the brown facial patch.

Adult male, breeding-plumage (Nahr el Kebir, Syria). Wing 5·6 inches; tail 2·4; tarsus 1·4; middle toe and claw 0·9; bill to gape 1·12.

Forehead, chin, and throat as high as the cheeks pure white, sharply defined across the fore neck against the rufous of the chest and the sides of the fore neck, which colour blends on the breast into the white of the underparts: a broad stripe from the bill to the eye, and expanding beneath it over the cheeks and ear-coverts, as also an incomplete band across the forehead, black; head and upper surface sandy brown, tinged on the sides of the crown and on the hind neck with the rufous of the chest; the margins of the scapular feathers and of the tertials are similarly coloured; wing-coverts with pale margins; the lesser coverts darker brown than the greater; primaries dark brown; from the 6th to the 10th white on the outer webs, except near the tips, the 1st shaft wholly white, the remainder brownish at the base and white near the tip; secondaries tipped with white; upper tail-coverts very pale brownish, broadly margined with white; tail darker brown, the feathers tipped with white, and the outer wholly of that colour; under wing-coverts white, and the under surface of the inner webs of the quills mostly white.

This example, shot on the 30th May, is not in perfect plumage; there are traces of a black band connecting the base of the bill with the incomplete band across the forehead, and these, when fully developed, would leave an isolated white spot above the lores. Mr. Hume has obtained it far advanced in breeding-plumage at Kurrachee as early as the 2nd February.

Female (Syria: May 16, 1877). Has the white throat, rufous chest, and hind neck of the male, but wants the black markings of the face and forehead, the lores and face being mingled rufous and brown, and the forehead above the lores white, the centre part in continuation of the culmen being brownish; the region above the eye is tinged with rufous as in the male.

Young. Birds of the year have but little white on the forehead; the entire lores and a band nearly across the chest are brown, and the margins of the upper-surface feathers slightly fulvous; there is also a fulvous patch on the sides of the chest.

Obs. A number of specimens which I have examined from Asia Minor in breeding-plumage correspond in all respects with the above descriptions. There is but little variation on either the bill or wing, and the pale rufous of the chest is much the same in extent and hue in old specimens.

A species somewhat allied to the present is *Æ. placida*, Gray, procured by Jerdon in Burmah, inhabiting China, where it is the *Æ. hartingi* of Swinhoe, and figured as such in the Proc. Zool. Soc. 1870, pl. 12. It has all the quill-shafts *brown*, and no white patch on the outer webs of the shorter primaries, but the tips are margined outwardly with *white*; the outer tail-feathers have a white tip and a subterminal brown bar, somewhat similar to the coloration in the Common Dotterel (*Eudromias morinellus*). The measurements, according to Mr. Hume, are—wing 5·7 inches, tarsus 1·35, bill at front 0·82. This species may perhaps occur as a straggler in Ceylon; it has, however, only once been obtained in India.

Distribution.—This fine Sand-Plover, though not so common as the next species, is nevertheless tolerably frequent in Ceylon. Layard may or may not have met with it; for in his catalogue he only enumerates one species of *littoral* Sand-Plover, which he styles *Hiaticula leschenaulti*, and which, as he informs me, in common with all the birds in his list, was identified by Blyth. This title was applied by Blyth to the present species ('Ibis,' 1867, p. 164), as can be plainly seen by his saying that the *Charadrius asiaticus* of Horsfield and Mr. Tristram was the same as *Ægialitis leschenaulti*, which statement fixes the bird as *Æ. geoffroyi*. In his catalogue, dated 1849, of the birds in the Asiatic Society's museum, however, he used the correct title for the Large Sand-Plover. Against the inference that Layard's birds were really the Large Sand-Plover, we must place the fact that the species which would be thereby excluded from his list is by far the most abundant; and therefore the point must always remain a moot one, as there are no specimens of either species at present in the Poole collection.

I first procured this Plover on the 4th of January, 1873, at the Kumburuputty salt lagoon, in the Trincomalie district; and my attention having been once drawn to it, I found it not uncommon*, frequenting other salt lakes near the sea in twos and threes, or affecting the sea-shore itself, particularly near the mouths of rivers. In the hot season (July) of the same year I met with it in small flocks on the sea-beach near Hambantota, and more particularly saw it in the hollows of the great sand hills near that place; these were immature or non-breeding individuals, or they would not have been in Ceylon at that period. I unfortunately did not shoot any until the last day I was in the district, and then only got one specimen, which was a yearling bird; others may have been in partial summer dress, as I procured specimens of the next species in that stage, though they were evidently barren birds. On the north-west coast I have only seen a few birds of this species. I have no particular note of the dates of its arrival and departure; but they must correspond with other shore-birds. I met with several individuals, evidently new arrivals, on flooded lands south of the Virgel, as early as the 13th of October.

In India it has chiefly been noticed on the north-west and north-east coasts. Jerdon remarks that he procured it at "Madras and elsewhere, but never far inland;" and Mr. Ball shot it at the mouth of the

* Subsequent to the publication of my paper in 'The Ibis,' 1875.

Chandballi river, north of the Godaveri. At the Laccadives it was not very common, according to Mr. Hume, for he only procured it at two islands—Cardamum and Kiltan. At Calcutta it is only rarely seen in the market; but on the eastern shores of the bay it appears to be more common. Dr. Armstrong says he found it abundant on the sands and mud banks near Elephant Point. It visits the Andamans and Nicobars. Capt. Ramsay got it in South Andaman; and it was observed by Mr. Hume at Port Blair, Macpherson's Straits, Camorta, and Montschall; it remains until the middle of May, and specimens have been procured in September. Mr. Hume met with it at Kurrachee harbour in thousands, and subsequently writes of its general distribution in the north-west as follows:—"I procured this species in Northern Guzerat, on the borders of the river. It is very common during the cold season along the coasts of Sindh, Cutch, and Kattiawar. But neither in Sindh nor in Jodhpoor do I know of its occurring inland, except at the time of its migration, from the 10th August till the 15th September, or during April and May, when, as in the case of *Squatarola helvetica* (which leaves earlier and returns later), it is met with at large pieces of water inland." Mr. Adam has obtained it in August in breeding-plumage at the Sambhur Lake. It is one of those species which Captain Butler noticed in the harbour at Kurrachee in the hot season. Proceeding beyond the confines of India, we find Severtzoff recording the capture of three specimens only in Turkestan in June, July, and August. One of these, the second, was obtained at Lake Chatir-Kul, at an altitude of 11,000 feet above the sea, and the third on the east coast of the Caspian. It must therefore breed in that country. In Asia Minor it has been procured by Mr. Danford; and in Palestine Canon Tristram found it, in company with the next species and the Common Dotterel, overspreading in flocks the desert between Arabah and Beersheba. Northward it extends to the shores of the Red Sea and the north coast of Egypt. In the peninsula of Sinai both Mr. J. K. Lord and Mr. C. W. Wyatt observed it, the latter gentleman having met with it in large flocks near Tor. Von Heuglin saw it in winter on the north coast of Egypt; and Captain Shelley saw a flock of about thirty on Lake Mareotis in the beginning of February, and near Damietta again observed considerable flocks of a Plover, which he considers was the present species. Von Heuglin met with it all along the coast of the Red Sea and Gulf of Aden, and considers it to be resident there, as he observed it from June until November. Mr. Blanford procured it at Massowa and in Annesley Bay, and at Zanzibar Dr. Kirk obtained it. It extends to Madagascar, where it was found to be common by Messrs. Schlegel and E. Newton. In the Seychelles group the latter gentleman procured it on the island of Mahé: he likewise records it from Mauritius. Its range extends to Cape Colony, where it is rare, according to Layard, who procured but one specimen on the Salt River, near Cape Town. On the south-west coast it is recorded from Benguela by Professor Barboza de Bocage; and this locality is by far its westernmost limit.

Returning to trace out its distribution in Eastern Asia, I do not find it recorded by any traveller from Siberia or Amoor Land, so that we may safely say that it has not a high northern range, although Mr. Whitely procured it in Japan. It must be, however, rare in these islands, for Messrs. Blakiston and Pryer do not record it. It is found on the China coast in winter, according to Swinhoe; moreover Père David states that numbers are to be seen in the Shanghai market in May, as many in breeding-dress as in that of winter. In the island of Formosa Swinhoe found it breeding, obtaining its eggs on the sandy coasts; and it is probable that the young birds there are those which migrate as far south as the north coasts of Australia. It is said to have been found in the Philippines, and by Godeffroy in the Pelew Islands. It is spread throughout the Malay archipelago, being found on some of its islands in the breeding-season; for in Celebes Meyer observed it on the Lake of Tondano in the month of June, and on that of Limbotto in July. It has been obtained in many places in Borneo by Diard, Schwaner, Mottley, and others; and in Sumatra (Lampong, &c.) and Java it has also been procured, having been first described by Horsfield from the latter island. Other islands on which it has been noticed are Flores, Timor, Gilolo, and Morotai. In New Guinea it was obtained by Herr Müller; and on the opposite coast of North Australia it is recorded from several localities, viz. Cape York (whence Mr. Harting has skins), Port Darwin, Port Essington, and the Gulf of Carpentaria, while from Rockingham Bay Mr. Ramsay likewise notes it.

Habits.—This Sand-Plover, as its name implies, is an inhabitant of the sea-shore, frequenting alike the sands on the open coast and the ooze and muddy foreshores of tidal lagoons, creeks, backwaters, and salt lakes in the vicinity of the sea. It does not, so far as I have observed, associate with any other species but the

next to be considered (the Lesser Sand-Plover); and I have, on one or two occasions, found it alone, both in small flocks and in scattered company consisting of two or three individuals. Under the first-named condition it was frequenting the secluded hollows on the summit of the great sand hill at Hambantota, and seemed to be resting when I met with it (about 10 A.M.) after the business of feeding in the morning. It is shier than its smaller relative, and all I procured were killed with long shots, as I always found it difficult to approach. On one occasion it was observed and procured on an inland situation, namely on some flooded meadows a few miles from the sea on the south bank of the Virgel; a few were seen here frequenting little grassy eminences which were surrounded by the water covering the land for a wide extent. In India it has been usually found on the sea-coast; and on the shores of Burmah Dr. Armstrong found it in company with immense flocks of "smaller Sand-Plovers," the species referred to being no doubt *Æ. mongolica*. On passage to more northerly latitudes, particularly in the north-west of India, it occurs, in common with other purely littoral species, far inland.

As regards its food, I have found the contents of its stomach to consist of small insects and larvæ, mixed with gravel; and Layard detected in it minute crustaceans and worms. Von Heuglin found it frequenting sand banks, coral reefs, and low-lying shores, sometimes in flocks and sometimes alone, whilst on other occasions it was associated with other shore-birds.

Nidification.—But little is known up to the present time concerning the breeding-habits of this Plover. It is probable that one great cradle of the species is in Western Asia and on the Red-Sea coasts. More specimens have been obtained in this region in summer plumage than anywhere else, except, perhaps, the China coasts, including Formosa. In the latter island Swinhoe found it breeding, and a series of its eggs, which I have had the advantage of examining, were procured by him. They are pointed ovals, rather stumpy at the small end, and with a large diameter for their length. They are clay-buff, with streaky blots throughout of inky black, mixed with some large blotches and numerous "pencillings" or irregular streaks of the same, under which there are blotches of purplish grey and bluish grey. They vary from 1·27 to 1·37 inch in length, and from 1·0 to 1·05 in breadth.

Together with these eggs, some others were collected by Swinhoe in the same locality, and identified by him as those of the Asiatic Golden Plover, which bird he says is common all the year round, breeding in great abundance on the south-west marshy plains. As I have above remarked in the preceding article, this is probably an error; and I think that the eggs all belong to the present species. The whole were probably brought to him by native collectors, and the smaller types, which I have just described, identified by him as those of *Æ. geoffroyi*, while the larger were taken for *Charadrius fulvus*. They are altogether too small, and look like dark heavily-blotched specimens of the eggs of the former species. There are 9 eggs altogether—rich stone-buff, very handsomely blotched throughout with sepia-black clouds and blots, mixed up with straggly markings of the same over spots of light brown and bluish grey. They are of the same shape as the eggs marked *Ægialitis geoffroyi*, measure 1·38 to 1·46 inch by 0·96 to 1·06, and are clearly not Golden Plover's eggs.

ÆGIALITIS MONGOLICA*.
(THE MONGOLIAN SAND-PLOVER.)

Charadrius mongolus, Pallas, Reise, iii. p. 700 (1776).
Charadrius mongolicus, Pallas, Zoogr. Rosso-As. ii. p. 136 (1811); Middendorff, Sibir. Reise, ii. p. 211, pl. 19. figs. 2, 3 (1853); Schrenck, Reis. im Amur-L. p. 411 (1860); Schlegel, Mus. P.-B. *Cursores*, p. 41 (1865); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1023 (1873).
Charadrius cantianus, Lath. *apud* Horsf. Trans. Linn. Soc. xiii. p. 187 (1821).
Charadrius rufinellus, Blyth, Ann. & Mag. Nat. Hist. xii. p. 169 (1843).
Hiaticula inornata, Gould, B. of Austr. vi. pl. 19 (1848).
? *Hiaticula leschenaulti*, Less. *apud* Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 109.
Ægialitis pyrrhothorax, Temm. *apud* Jerdon, B. of Ind. iii. p. 639 (1864).
Ægialitis mongolicus, Pallas, Harting, Ibis, 1870, p. 384; Legge, Ibis, 1874, pp. 27, 28, 29; Salvadori, Uccelli di Borneo, p. 310 (1874); Hume, Str. Feath. 1876, pp. 293, 463; Armstrong, *t. c.* p. 339; David & Oust. Ois. de la Chine, p. 427 (1877).
Ægialitis mongola (Pallas), Walden, Ibis, 1873, p. 317; Hume, Str. Feath. 1878 (B. of Tenass.), p. 455, et 1879, viii. p. 112 (List Ind. B.); Ball, ibid. 1878, vii. p. 227.
Cirrepidesmus mongolicus (Pallas), Hume, Str. Feath. 1873, p. 230, et 1874, p. 287, et 1875, p. 12; id. Nests and Eggs, iii. p. 571 (1875).
Ægialitis mongolica (Pall.), Walden, Trans. Zool. Soc. 1875, ix. p. 227; Legge, Ibis, 1875, p. 401.
Pallas's Shore-Plover and *The Lesser Sand-Plover*, Jerdon et auctorum; *Tschitsche hirugu*, Amoor Land (Middendorff). *Kotan*, Ceylonese Tamils; *Watuwa*, Ceylonese.

Adult male and female (Ceylon). Length 7·1 to 7·5 inches (average about 7·3); wing 4·75 to 5·0; tail 1·9 to 2·0; tarsus 1·2 to 1·3; middle toe and claw 0·85 to 0·9; bill to gape 0·7 to 0·8, at front 0·68 to 0·72.

Iris deep brown; bill black, slightly pale at the base beneath; tibia and feet plumbeous, with the tarsi slate-grey, the edges of the scales being darker, or in some greenish plumbeous entirely.

Winter plumage (Ceylon). This species almost entirely resembles the last; but, as it is much more common, I will give a description of it in detail for the benefit of local students and collectors:—

Above greyish brown, paling on the hind neck, and with the margins of the feathers paler than the rest; forehead white, passing above the lores and over the eyes, behind which the supercilium widens and is joined by a white streak from beneath the eye; wing-coverts edged with whitish; edge of the wing and tips of greater coverts white; tips of the secondaries, as also the outer edges, and a portion of the web near the shaft of the innermost, white; tertials more or less finely edged with white; primaries and shafts as in the last; feathers of the rump and upper tail-coverts not quite so broadly edged as in the last; tail the same, but slightly less graduated; lores brown, darkest at the eyelid; cheeks and ear-coverts brownish; beneath white, the brown of the sides of the neck encroaching on the chest in some more than in others; under wing and axillaries as in the last, pure white.
The amount of white varies on the forehead, consequent on age.

Adult male, breeding-plumage (Swatow, 24th May). Throat, upper part of fore neck, and a broad frontal band, together with the under surface, white; a jet-black band from the bill to the eye, and expanding beneath it to the ear-coverts, and another narrow connecting one across the forehead; a broad rufous band, of a *darker hue* than in

* I adopt the spelling as altered by the author of the species himself in 1811, as it is more correct than his original name *mongola*.

the last species, across the chest, extending over the sides of the neck and almost across the hind neck; above and behind the eye there is a white patch joining the rufous; the crown tinged with fulvous next the black band; above darker brown than *Æ. geoffroyi*, and not tinged with rufous; the inner primaries with less white, but the secondaries and greater coverts tipped with white in the same way; outer tail-feathers brown on the inner web. This example measures:—wing 5·3 inches; tail 2·1; tarsus 1·15; bill to gape 0·8.

Some examples have the rufous more intense than others. The example No. 1738 in the Swinhoe collection, referred to by Mr. Seebohm (Ibis, 1879, p. 25), is an instance of such, the front of the crown being almost as richly coloured as the chest.

Occasionally the forehead is black down to the bill, the white frontal band being entirely wanting. Mr. Harting instances a specimen from Calcutta, and others from India, as well as from New Guinea, in this plumage, and Schrenck describes one from the Amoor. In others the black is bordered by white feathers, and in the specimen which formed the type of the supposed species *Æ. pyrrhothorax*, founded on this character, all but the tips of the frontal feathers are white.

Specimens are to be met with, as mentioned below, in the hot season, which appear to be in a partial summer dress, with traces of a rufous band extending completely across the chest, but with the forehead brown, as in young birds; these examples are, in all probability, in the second year, and, notwithstanding that they are barren birds, have made an advance towards the nuptial livery.

Young, in first autumn. Upper surface slightly darker than the adult in winter plumage, with the feathers margined (most conspicuously as regards the scapulars, tertials, and wing-coverts) with buff and buff-grey; forehead in some quite brown, in others buff at the base of the bill; a blackish-brown spot round the anterior corner of the eye; the sides of the chest fulvous, brighter in some than in others, and sometimes with this colour almost crossing the chest; the upper breast sometimes shaded with buff; innermost secondaries with less white on the outer webs; the spot on the outer tail-feathers smaller than in the old bird.

Obs. This species being migratory through India to Ceylon, Indian examples call for no comparison with ours. Measurements are given as follows:—(Furreedpore) length 8·42 inches, wing 4·73, tarsus 1·25, bill at front 0·75 (*Cripps*); (Irrawaddy delta, 5 males and 5 females) length 7·0 to 8·2, wing 4·8 to 5·15, tarsus 1·3 to 1·4, bill from gape 0·85 to 1·0 (*Armstrong*)—the maximum length of bill in this case is exceptional; (Sindh) length 7·25 to 8·0, wing 4·8 to 5·0, tarsus 1·27 to 1·39, bill at front 0·66 to 0·71 (*Hume*).

Distribution.—The Lesser or Mongolian Sand-Plover is very abundant in Ceylon, frequenting the north, north-west, and north-east coasts, the eastern side of the island, and the south-eastern sea-board, as well as occurring not unfrequently in the Galle district. I have also met with it on the islands in the Negombo lake; and on the Galle face (Colombo) during the north-east monsoon it is quite a common bird. I have observed it on the sands near Mt. Lavinia, and it may therefore be safely said to inhabit the entire sea-board of Ceylon. It is noteworthy that it is more often seen, and perhaps in greater numbers, on the public resort at Colombo, above-mentioned, than in any other locality in the Western Province. It is equally fond of the esplanades at Trincomalie and Jaffna, and, in fact, any bare land near the sea-shore or bordering the salt lakes is sure to be tenanted by it. It is, however, found on the edges of all the salt lagoons and at the mouths of rivers on the north and east coasts, as well as on grassy lands. In the month of October I have met it in large numbers on flooded meadows some distance inland on the south bank of the Virgel. In the Hambantota district it was to be found in 1873 frequenting the dry shores of the leways plentifully during the hot season. Most individuals were in pure winter plumage, but a few showed traces of the rufescent breast. It arrives in the island in numbers in September and October; but not a few may be seen on the north coast some weeks previous to that time. It departs at the end of April and during May; but I have no doubt that many immature birds remain in the island throughout the year.

In regard to India, Jerdon met with it, he says, in the Carnatic, on the Malabar coast, and elsewhere, but seldom far inland; he observes that it is bought in great numbers to the Calcutta market; and Mr. Hume remarks that a few are daily to be seen there during the season. He records it from the Laccadives, where he saw it at Cardamum. Mr. Ball met with it in Singhbhum and on the coast of Orissa, at the mouth of the Chandballi river. In Furreedpore Mr. Cripps only once saw it on a chur of the Muddoomutee river. How far it extends up the Ganges I am unable to say, but probably during the season of migration only will it be found inland. In June it has been procured at Allahabad. On the opposite side of

the peninsula it is common on the sea-board. Major Hayes-Lloyd saw it in large flocks in Kattiawar; and Mr. Hume procured it on the borders of the Runn in Northern Guzerat, and states that it is very common on the coasts of Sindh, Cutch, and Kattiawar, but not found inland except during the time of migration, *i. e.* in April, May, August, and September. He observed it in vast numbers in Kurrachee harbour and on the Mekran coast; and in the former locality Capt. Butler has seen it in the hot weather. Turning eastward we find Dr. Armstrong recording it as extremely abundant, occurring in immense numbers on the sand and mud flats between Elephant Point and China-Bakeer, and on the mouth of the Rangoon river. Capt. Beavan procured it on the Salween, near Moulmein; and Mr. Oates says it is tolerably common in Pegu. To the province of Tenasserim it is a common cold-weather visitant, occurring on the coast and the shores of estuaries. It was procured at the extreme south on the Pakchan river. In the Andamans and Nicobars it is very abundant, and the commonest species on those coasts next to the Sandpiper (*Tringoides hypoleucus*). It is found there in July, August, and September in partial summer dress; and I have no doubt the examples procured by Mr. Davison in this plumage were immature birds showing a mixture of nuptial and youthful livery. Mr. Hume records it from Singapore; but I do not find it spoken of as inhabiting Sumatra, where its ally, the last species, has been recently obtained. In Java it is said to be the *Æ. cantiana* of Horsfield, as Blyth examined in Calcutta what was supposed to be the type specimen from that island; in addition to which Horsfield gives neither measurements nor description of the species. In Borneo it has been obtained at Pontianak, in Sarawak, and in the south of the island. In Ceram it has been obtained by Hoedt, in Morotai by Bernstein, in Aru by Wallace, and in New Guinea it is the reverse of rare. To the south it has been found in the island of Oomago in Torres Straits, and at Port Essington Mr. Gilbert obtained it. In his recent list of Australian birds, Mr. Ramsay notes it from Cape York and Rockingham Bay, in lat. 22° S., which is its southernmost limit. Turning north, again, we find Cuming procuring it in the Philippines, and Swinhoe obtaining it in North-east and North-west Hainan in March. He never met with it on the south coast of China, but saw it in abundance in Shanghai, where also Père David met with it in May. It has been obtained in the Corea, and also on the shores of the sea of Okhotsk, where Middendorff met with flocks of females in pairs in July. In Japan it has been procured in Hakodadi and South Yesso. In this quarter of the globe it has been met with as far north as the Choris Peninsula, in Behring's Straits. Pallas first found it on the confines of Mongolia near salt lakes between the rivers Onon and Argun; and Radde observed it in the same region at Tarei-nor in May. Schrenck procured it on the Amoor. It evidently breeds in all this region; and its summer-quarters do not seem to extend to the westward in these latitudes, for Seebohm did not see it on the Yenesay. Prjevalsky does not record it from Koko-nor, through which it must needs pass on its migration from Thibet to Mongolia. Stoliczka procured it at Kiangsira in Thibet; but Dr. Scully did not meet with it in Kashghar. It was, however, seen on the Chimouraree Lake in Ladakh by Dr. Adams, and was breeding there at the time, the young being hatched and the season too far advanced to obtain eggs.

It breeds, according to Severtzoff, in the south-eastern portion of Turkestan, and occurs on passage in the north-western part, but was not seen above an altitude of 1000 feet. Mr. Blanford obtained it in the islands of the Persian Gulf, and observes that it has not been met with on the Caspian. In Palestine Canon Tristram found it on the Kishon. It extends to the coasts of the Red Sea, and as far south as the Gulf of Aden, where Von Heuglin procured it in winter plumage on the Somauli coast: Blyth also received it from Aden. It has on one occasion only appeared in Europe, when it was captured near St. Petersburg.

Habits.—This Sand-Plover associates in large flocks, as well as in small companies, which disperse themselves over a good deal of space on the muddy flats and tidal sands bordering the numerous lagoons, lakes, and backwaters of the northern and eastern shores of Ceylon. In its company may be found a few Kentish Plovers and also the little Ringed Plover, while occasionally the last species, *Æ. geoffroyi,* may be seen with it. It is not by any means shy; and when frequenting bare grassy places like the Galle face, where it appears, after rain, with the Golden Plover, its behaviour is rather stupid, standing bolt upright and allowing itself to be approached to within a short distance before taking flight. Small flocks of a dozen or more are frequently to be seen on these public resorts after a heavy night's rain—remaining there for several days, in spite of the hundreds of carriages, pedestrians, and bullock-waggons which are continually

passing them. They run about and feed apart, covering about a quarter of an acre perhaps, and when disturbed all get up together and fly leisurely further on. In September they commence to appear at Colombo, and are common in November and December, and may then be shot quite stained, like the Pipits, with the cabook-dust of the Galle face. The majority of those which arrive first are young birds; and more females are obtained than the other sex. When they first come to the island they are tamer than they are in the middle of the season, or in the spring before migrating, when they become somewhat shy and restless. The short bill of this species, as well as its smaller size, always serve to distinguish it, at a distance even, from its congener *Æ. geoffroyi*. Its note is a sharp plaintive whistle; and I have heard a trilling sound uttered by two birds associating together. Its food consists of sand-flies, small worms, minute crustaceans, and insects, the latter of which it entirely feeds on in grassy places, which, I think, are frequented more by it than by any other Sand-Plover in Ceylon. Both this and the last species are, comparatively speaking, inactive birds, for they do not run hither and thither, taking stretches of 10 or 15 yards, with an almost invisible movement of the legs, as one sees in the case of the Kentish and Ringed Plovers; but, on the contrary, they move rather slowly and take short runs. When winged, however, and chased they run with great speed; and Middendorff says that they swim and dive well when wounded.

Nidification.—As mentioned above, Dr. Adams found this species breeding in Ladakh, the mountainous portion of Thibet bounding Cashmir on the east. Here he found the young at the Chimouraree Lake, but he was too late to obtain eggs. Mr. Hume says that it breeds in May and June about this and other Thibetan lakes.

ÆGIALITIS CANTIANA.

(THE KENTISH PLOVER.)

Charadrius cantianus, Lath. Ind. Orn. Suppl. p. 66 (1801); Gould, B. of Eur. iv. pl. 298 (1837); Jerdon, Madr. Journ. 1840, xii. p. 203; Layard, B. of S. Afr. p. 296 (1867); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1055 (1873).

Ægialites cantianus (Lath.), Bp. Comp. List, p. 45 (1858); Swinhoe, P. Z. S. 1871, p. 404; Holdsw. ibid. 1872, p. 471; Legge, ibid. 1875, p. 374; Butler, Str. Feath. 1877, p. 290.

Hiaticula cantiana (Lath.), Blyth, Cat. B. Mus. A. S. B. p. 263 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 109.

Ægialitis cantianus (Lath.), Jerdon, B. of Ind. iii. p. 640 (1864); Shelley, B. of Egypt, p. 240 (1872); Legge, Str. Feath. 1875, p. 372; Armstrong, ibid. 1876, p. 340; Hume, *t. c.* p. 464.

Ægialitis cantiana (Lath.), Legge, Ibis, 1875, p. 401; Irby, B. of Gibraltar, p. 162 (1875); Dresser, B. of Eur. pt. 49 (1876); Hume, Str. Feath. 1879, viii. p. 112 (List Ind. B.).

Ægialophilus cantianus (Lath.), Hume, Str. Feath. 1873, p. 230; id. Nests and Eggs, iii. p. 571 (1875); Scully, Str. Feath. 1876, p. 185.

Kentish Dotterel of some; *See-Regeupfeifer*, German; *Charran*, Spanish. *Chullok*, *Sai Yamghurchi*, Turki (Scully); *Shiro-chidori*, Japanese; *Kotan*, Ceylonese Tamils.

Watuwa, Sinhalese.

Adult male (Ceylon). Length 6·1 to 6·3 inches; wing 4·1 to 4·2; tail 1·5 to 1·7; tarsus 1·0 to 1·1; middle toe and claw 0·65 to 0·7; bill to gape 0·6 to 0·68.

Iris dark brown; bill black; tibia and feet dusky plumbeous; the tarsus paler or bluish, in some greenish.

Breeding-plumage (Kanthelai, August). Head, back, and wing-coverts ashy brown, darkening into blackish brown on the upper tail-coverts and four central rectrices, and edged pale throughout; forehead, a broad superciliary band, cheeks, throat, and entire under surface white, passing in a narrow collar round the hind neck; a broad frontal band, lores, ear-coverts, and a patch on each side of the chest black, the ear-coverts paler than the rest; a pale rufous border above the black frontal band and round the upper edge of the supercilium and collar; quills blackish brown, paler on the inner webs, and with the shafts white, the first being purer than the rest, the outer webs of the innermost primaries with a white edge; the secondaries tipped white, and with the base of the inner webs the same; the three outer pairs of rectrices white, with a brownish wash on the inner web of the third.

Adult female in summer (shot with young, Hambantota, July). Wants the black frontal band, black stripe beneath the eye, and patch at the sides of the neck; lores, forehead, and supercilium white, as in the male, a brown stripe instead of a black one through the lores; feathers anterior to the eye, bordering the white fringe, blackish; a narrow whitish band across the hind neck edged obscurely with buff: the patch on the sides of the chest brown, like the back. This individual has the feathers of the head tipped with white, which appears to be caused by abrasion and bleaching from the effects of a burning sun on the arid salt-pans on which I shot it.

Another example, shot from the nest at Trincomalie, is identical in all respects save the white tippings of the head-feathers, the crown being plain brown, like the back, the feathers only finely edged pale. Specimens shot at this time are all in the abraded plumage, which is moulted in August.

In a series of females the length varies from 5·9 to 6·2 inches, and the wing from 3·7 to 4·1.

Male in winter. Differs from the male in summer in wanting the rufous colouring on the head, and in the black band on the head being almost obsolete; the lores and the stripe behind the eye are brownish, and so are the patches at the sides of the chest; the white collar is of the same width as in summer, and edged above with rufous.

Young. The nestling, when able to follow the parent bird, is fulvous above, with black lines and spottings on the crown and nape, and a velvety-black streak down the centre of the back; on either side of this streak the back is marked with blackish; down of the tail black; beneath the body is white; legs and feet sickly olive-green.

The immature plumage of the first year is quickly acquired, and resembles that of the adult female; the forehead is white, and the supercilium *whitish*; the nuchal collar is very broad, but interrupted sometimes in the centre. Males and females are alike.

Obs. An examination of a large series of Kentish Plovers from various parts of the world will show that it is a very variable species as regards size; and the Ceylon form, particularly as regards females, is, perhaps, the smallest of all, consisting as it does of tropical-bred birds, which must needs be, owing to climatic influence, a stunted race. It is likewise a variable bird as regards plumage, some examples being much more highly tinted with rufous on the head and across the neck than others; and I think our race will be found to be almost less richly coloured than any other. A male in breeding-plumage, procured by myself in the island of St. Vincent (May), has the rufous bordering very bright and spreading entirely over the crown; the black frontal band, loral stripe, and chest-patches are intense black: wing 3·95 inches, bill at front 0·68, tarsus 1·1. A Sussex male has the wing 4·2, tarsus 1·1; it has the frontal black band 0·4 inch wide, the white collar bordered by bright rufous, but the head scarcely tinted with it. One from Constantinople (April 26th) measures—wing 4·0, tarsus 1·0, and has the rufous very bright above the eye-stripe and hind-neck collar. A female, measuring in the wing 4·3 inches, has a complete narrow bar across the hind neck tinged with rufous above. Some variation exists in the colouring of the legs. My St.-Vincent example has the tarsus light plumbeous, with the joints and toes blackish, like Ceylon birds. Dr. Scully cites the legs in a Yarkand example as being *greyish black*; and Dr. Armstrong speaks of those of Irrawaddy specimens as being plumbeous grey. His dimensions of a series are:—length 6·5 to 7·0 inches; wing 4·2 to 4·5; tail 1·8 to 2·2; tarsus 1·1 to 1·25; bill from gape 0·75 to 0·95.

Swinhoe's species, *Æ. dealbata*, from China, which Mr. Harting identifies with *Æ. peronii* of Temm., is closely allied to the present, but has the upper surface more "sandy;" and two or three specimens before me want the stripe through the lores; the legs are fleshy yellow. The wing measures 4·4 to 4·7 inches.

Æ. nivosa, from America, the representative of *Æ. cantiana*, has no stripe through the lores, which are *constantly* white. It comes close to *Æ. peronii*, but has a smaller bill.

Æ. ruficapilla, the Australian ally of the present, differs in having no white ring round the neck, and wants the black patch on the sides of the chest; a rufous stripe extends across the forehead and over the eye to the nape. Wing 4·1.

Distribution.—This well-known little Plover frequents the dry districts of Ceylon. It is very common from the Wellaway river eastward all along the sea-board to Batticaloa, and thence northward is found in suitable localities, which between that town and Trincomalie are not so numerous as further south. Beyond Trincomalie again it is to be found on the borders of, and open land surrounding, the backwaters and salt lakes. In the Jaffna peninsula and on the sands of the Lake it is common; and down the west coast to Manaar I found it equally plentiful. Mr. Holdsworth procured it at Aripu; and south of this it is to be found down the coast to Chilaw. Between that place and Colombo it is less numerous, and only found, according to my observation, in the cool season. In the month of February I have seen it on the islands at the mouth of the Negombo Lake. South of Colombo I never noticed it; but it may occur as a straggler in the north-east monsoon. In the breeding-season it is to be met with inland at large tanks, such as Minery and Kanthelai, where I have found it tolerably abundant and nesting on the shores of these sheets of water: I have not met with it at the smaller tanks; but I have no doubt it occurs at Anaradhapura and elsewhere at the borders of restored lakes.

It is probable that though stationary for the most part in the island there is an influx of migratory birds from the mainland in October, and a diminution again in their numbers in the spring, when some may depart for the north of India.

Leaving the confines of Ceylon, we find Mr. Hume meeting with it at Cardamum in the Laccadives; and, as regards the mainland, Jerdon observes that it is more generally diffused in India than the last two species, being found far inland on the banks of rivers and large tanks, as well as at the mouths of rivers on the sea-coast, which latter localities it prefers. I do not find it recorded from the Deccan or from Chota Nagpur, although Mr. Hume has received it from the Raipur district. At the mouth of the Chandballi river Mr. Ball met with it; but he does not record it from the interior of Orissa. About Calcutta it is not uncommon in the cool season; but to the north-east of this locality Mr. Cripps did not meet with it. In the Irrawaddy

delta it is said to be as abundant as the last species, feeding and intermingling with it. Capt. Ramsay procured it at Tonghoo, and Mr. Davison at Theinzeik, Thatone, Amherst, and Mergui. Mr. Hume observes that it is sparingly distributed about the coasts, creeks, and rivers of the province in the cold season, but has not been observed far inland except at Tonghoo, nor in the extreme south. It is absent from the Andaman and Nicobar Islands, and has not been met with in the Malay peninsula. In the archipelago it has not as yet been observed, although we find Horsfield including in his catalogue of Javan birds a Plover which he calls this species; but Blyth, who examined the bird, is said to have identified it with the Mongolian Sand-Plover; and until it is found on the Malay islands, Ceylon will remain its most southerly limit. Following up the east coast of the continent before returning to North-west India, we find it recorded as common in winter on the coast of China; and Père David remarks that he found it breeding in large numbers on the Hoang-ho. It has recently been obtained by Mr. Everett in Mindanao (Philippines), and has also occurred in the Pelew Islands. In Japan it is common; but on the mainland in Eastern Siberia it is rare. Schrenck did not meet with it in Amoor Land, nor Middendorff in North-east Siberia, which is evidently beyond the northern limits of its range. Prjevalsky, however, met with it throughout Mongolia and about Koko-nor in flocks of three to seven individuals on the shores of salt lakes, where he considers it probable that it breeds. In spring it appears in South-east Mongolia, and about Koko-nor at the end of March. Pallas found it frequenting the salt lakes in Dauria; and Radde procured it in Tarei-nor. In Eastern Turkestan it is, says Dr. Scully, a seasonal visitant to the plains, arriving about the end of March and disappearing in winter; and it was found breeding by him at Sughuchak. Severtzoff also states that it breeds in North-west Turkestan up to an altitude of 4000 feet. It is found on the Mekran coast; and Capt. Butler met with it breeding on the island of Astolah, in the Gulf of Oman. In Kurrachee harbour it is common in the cold season; and Mr. Hume remarks that he met with it at that time all along the banks of the large rivers both in the Punjab and Sindh, and occasionally in some of the inland waters of the latter. He likewise procured it in many places in Northern Guzerat, Kattiawar, and Jodhpoor, where it is common on the coast and inland on the banks of rivers and lakes. At the Sambhur Lake Mr. Adam met with it in large flocks both during the rains and in the cold weather.

It extends through Persia, Palestine, and Asia Minor to Europe, and in the Holy Land was found to be common by Canon Tristram. He met with it near the Kishon, and remarks that it breeds in several places in Palestine. In Turkey it is not uncommon; Messrs. Elwes and Buckley found it breeding on the Bulgarian coast. In Greece, Lindermeyer and Von der Mühle met with it. It is not common in Transylvania, but has nevertheless been found breeding in the country. In Sardinia it is resident throughout the year, in Malta a straggler, and in Italy common but local. It extends through Central Europe, being rare in Southern Germany, to Denmark and Sweden, in the south of which latter country it breeds, though it does not seem to visit Norway. It has not yet been recorded from Iceland and the Faroes, and probably never occurs in these islands. In England it is found only in the south-east, breeding in no other counties but Sussex and Kent. In France it is common on the west coast, and in the Channel Islands it is likewise plentiful. It is not uncommon in Spain, where Mr. Saunders found it breeding on the plains in the south; and near Gibraltar it is very abundant, being found there throughout the year, but most plentifully during the season of migration. In Tangier, Favier states that it is resident and found at the mouths of the rivers; but at the same time many are migratory, arriving in September and leaving again in spring. Mr. Drake likewise records it from Morocco; in Algeria it is common, extending southward into the Sahara, where Canon Tristram found it universally distributed, breeding on the salt lakes there. In Egypt it is plentiful in winter, especially near Cairo; and to Nubia it likewise extends. Von Heuglin observed it on the Nile, but more frequently on the shores of the Red Sea, where it is found in summer, no doubt breeding there, and extending in September and October to the Gulf of Aden. It ranges down the east coast to Mozambique, where it has been found, and thence to Cape Colony, where one specimen is recorded by Layard as having been procured at Knysna. As it has not been recorded from the west coast, I imagine that any stragglers which find their way to South Africa wander thither by way of the east coast, and that this species does not extend down the western side much further than the latitude of the Cape Verds, in one island of which group (St. Vincent) it is resident, as I have myself shot it there in May while breeding. It has also been obtained in the Canary Islands; and in the Azores Mr. Godman found it plentiful in Fayal and Terceira, where it breeds; he likewise met with it in St. Michael's.

Habits.—This interesting little Plover frequents bare land, sandy wastes, dried-up marshes, stony, pebbly reaches along the shores of lakes, lagoons, and salt-pans, and, in fact, any inviting spot which is not very damp in the vicinity of water. It is the exception to find it on muddy foreshores, tidal flats, or ooze; and in the north of Ceylon, where these localities are crowded with Sandpipers, Stints, and the two preceding species, the present bird was observed generally running along the dry edge of the foreshore which had been untouched by the tide, or picking up insects on the burnt-up grass-land still further away from the water. It is fond of wide stretches of sand, such as the vast flats at the head of the Jaffna lake, on which I have seen solitary pairs tripping along almost miles from any other bird. It is at times, as Messrs. Brooke and Shelley observe in their respective writings, difficult to see when standing motionless on parched-up wastes, as the colour of its plumage exactly resembles the soil on which it is reposing. It is very active, running with a very quick movement of its little feet whenever it moves, and when approached runs for 40 or 50 yards without stopping. If startled then, it rises, uttering its double note *chit-ek*, which is not generally repeated until a little interval has elapsed; it is sometimes uttered while the bird is running. I have found it much wilder in some localities than in others; but on the whole it is a tame bird. It is rarely met with in greater numbers than half a dozen, and such a little troop do not associate in very close company, but generally spread over a considerable extent of ground, each member searching for its food quite independently of its neighbours. It is oftener seen singly or in pairs than in little flocks. Its flight, like that of other Sand-Plovers, is regular, and performed with quick though somewhat measured strokes; and before alighting it stretches out its legs and skims along with extended wings. It feeds much on sand-flies, sand-worms, and captures small flies and insects when searching on grass-land for food; I have also found very minute shells in its stomach.

Nidification.—This bird breeds in the south-eastern and northern parts of Ceylon. I procured both eggs and nestlings in down at Hambantota at the end of June and first week in July. It nests on the dry foreshores of the salt lagoons or leways in this district. Near Trincomalie I have found its eggs in a dried-up field near the borders of a salt lake, and at Kanthelai tank on shingly banks and strips of pebbly sand close to the water's edge, both at the beginning and end of July. The nest is generally placed in a depression in the ground, often in the footprints of cattle; but it seems sometimes to be partially formed by the bird. The lining consists of tiny pebbles or pieces of shell; but if the nest is made in coarse sand or fine shingle there is scarcely any foreign matter introduced into it, and the eggs repose in the natural hollow only. The points are sometimes buried in the hollow of the nest, the eggs thus assuming quite a vertical position. The parent bird generally leaves her eggs quietly, while the searcher is still at a distance from her position, and runs some distance from the nest before flying; but I have known one sit until I approached to within thirty or forty yards of her. The eggs are pointed at the small end, but not pyriform; they vary in size considerably, two specimens from the same locality (Kanthelai), as exemplifying the extremes, measuring 1·23 by 0·91 inch and 1·1 by 0·84. The ground-colour is either yellowish stone-colour or olivaceous stone, between which shades there are several tints noticeable. The markings are linear in character, and though they vary in extent and form there is the same tendency to run into hieroglyphic-like streaks and pencillings in all. Some are entirely marked with these blackish zigzag and highly erratic streaks throughout the surface, while others have this colouring intermingled with spots and small blotches of the same; and all eggs have primary or underlying spots and markings of bluish grey. Some specimens are olive-grey, covered nearly uniformly with small irregular blots of dark sepia over indistinct spots of bluish grey, with here and there streaks, strokes, and pencillings of a deeper hue; in others of the same ground-colour the markings are most numerous at the obtuse end, and the egg covered with longer streaks and scratches. Three is the maximum number of eggs, and in many nests I only found two. A pair of abnormally coloured eggs in my collection, taken at Kanthelai, are of a dull olive-stone, with here and there a few distantly-situated clouds of inky black, with smaller spots of the same over numerous lighter inky-grey spots; they measure 1·17 by 0·85 inch and 1·16 by 0·86. A series of European eggs examined by me do not differ generally from those I have from Ceylon; the smallest specimen in a large series measures 1·1 by 0·85 inch.

I append the following extract on the habits of the parent birds while breeding, from my notes in the P. Z. S. 1875, p. 375:—"The various devices resorted to by the old birds to attract attention and draw away

the intruder from the nests were most interesting to witness. They consisted in the bird flying off to the right hand in front and then circling away across me to the left and making a circuit in rear until it came round to where it rose; this movement it would perform uttering the ordinary note, *chit-ek, chit-ek*. On alighting it would run off, supplementing this sound with a short whistle; and if successful in inducing me to follow it, it would squat on the ground for a moment and continue on again with a low harsh cry. Were, however, its powers of persuasion not sufficient to draw me away in pursuit of it, it would rise and make the same circuit as before, always alighting to my right hand about 30 yards from where I stood. These movements were performed while I was in actual search of the nest; when approaching the vicinity of a nest for the first time, however, my attention was always drawn to the bird running along with its wings trailing on the ground."

ÆGIALITIS CURONICA.

(THE LESSER RINGED PLOVER.)

? *Charadrius dubius*, Scop. Del. Flor. et Faun. Insubr. p. 93 (1786, *ex* Sonnerat).
Charadrius, sp. nov., Beseke, Schr. Berl. naturf. Gesell. vii. p. 463 (1787).
Charadrius curonicus, Gm. Syst. Nat. i. p. 692 (1788).
Charadrius philippensis, Lath. Ind. Orn. ii. p. 245 (1790).
Charadrius minutus, Pallas, Zoogr. Rosso-As. ii. p. 145 (1811), juv.
Charadrius pusillus, Horsf. Trans. Linn. Soc. xiii. p. 187 (1821).
Hiaticula philippina (Lath.), Blyth, Cat. B. Mus. A. S. B. p. 263 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 109.
Ægialitis philippina, Scop. *apud* Jerdon, B. of Ind. iii. p. 640 (1864).
Ægialites dubius (Scop.), Holdsw. P. Z. S. 1872, p. 471; Legge, Ibis, 1874, p. 28; David & Oustalet, Ois. de la Chine, p. 429 (1877).
Ægialitis fluviatilis (Bechst.), *apud* Hume, Str. Feath. 1873, p. 230; id. Nests and Eggs, iii. p. 572 (1875).
Ægialitis dubia (Scop.), Walden, Trans. Zool. Soc. 1875, ix. p. 227; id. P. Z. S. 1877, p. 701; Hume, Str. Feath. 1879 (List B. of Ind.), p. 112.
Ægialitis curonica (Gm.), Butler & Hume, Str. Feath. 1876, p. 12; Dresser, B. of Eur. pt. 51, 52 (1876); Hume, Str. Feath. 1878 (B. of Tenass.), p. 456.
? *Petit Pluvier à collier de l'isle de Luçon*, Sonnerat; *Le petit Pluvier à collier*, *Lesser Ringed Dotterel* of some authors; *Lavadeira*, Portuguese; *kleine Pluvier*, Dutch. *Burong Booi*, Sumatra (Raffles); *Shaiarak Chullok*, Turki (Scully); *Zirrea*, Hind.; *Bytu ulanka*, Telugu (Jerdon); *Kotan*, Ceylonese Tamils.
Ola watuwa, Sinhalese.

Adult male and female (Ceylon). Length 6·8 to 7·2 inches; wing 4·3 to 4·7; tail 2·4 to 2·6; tarsus 1·0; middle toe and claw 0·75 to 0·8; bill to gape 0·6, at front 0·53. Females are larger than males.

Iris dark brown; bill black, yellow in some at the base of the under mandible; eyelid yellowish; legs and feet dusky yellow; joints and tips of toes greenish brown.

Male, winter plumage (Trincomalie, 21st November). Head, nape, upper back, scapulars, tertials, and wing-coverts hair-brown, paling on the front of the crown into a broad buff-white band on the forehead; a blackish band passing from the bill through the lores and under the eye to the ear-coverts; a white orbital fringe except at the extreme corner, where it is black; chin, throat, and a collar round the hind neck white; across the chest a blackish band, tinged with buff in the centre, expanding on the sides of the chest, and passing as a narrow edging round beneath the white collar; lower back and rump paler brown than the upper back; primaries black-brown, the innermost narrowly tipped with white; secondaries pale brown, tipped with white, and the innermost with the terminal portion of the outer webs white; 1st primary-shaft white, all the rest dark brown; two central tail-feathers brown, darkening into blackish brown at the tip; next three dark brown, with a quarter inch of the tips white; remainder white, with a black bar on the inner web; under surface and under wing white.

The black band in some does not extend round as a border to the white ring; these are apparently immature birds.

Summer plumage (China). Wing 4·53 inches; tail 2·4; tarsus 0·91; middle toe and claw 0·81; bill at front 0·57.

Brown of the back, wings, and tail slightly darker than in winter; a broad black band ($\frac{1}{8}$ inch wide) passing from the bill above and beneath the eye and covering the ear-coverts; a broad antecoronal band of black (0·3 inch) joins the black above the eye, in front of which there is a pure white frontal band separated from the base of the bill

by a black streak; a broad ring of black completely encircles the lower part of the neck, above which a white band passes across the hind neck and joins the white of the throat.

An example shot on the 9th of February in Ceylon is in process of a change to this dress. The loral stripe and cheeks are brownish black, as in winter; the black band above the forehead is narrow and irregular; the white feathers above the eye are changing to black, and the pectoral band is mixed black and white, and does not extend to the back of the neck.

Young. It is probable that the nestling in down resembles the young of *Æ. hiaticula* of Europe. In this the back and wing-coverts are buff-grey, mottled with black, a dark border running round the flanks, and separating this colour from the white of the under surface; forehead and a broad band across the hind neck white; head, nape, and ear-coverts grey, mottled with black and bordered by a black edging round the nape.

Immature birds in first autumn have the loral stripe and facial band brown; the pectoral band present in the form of a brown wash across the chest; and the forehead has less of the buff-white than in the adult in winter; the wing-coverts, upper back, and scapulars are edged with buff-grey; tail-coverts tipped with the same, and the central tail-feathers tipped with buff.

Obs. Measurements given by various Indian writers of late are:—♀ (Irrawaddy), length 6·8 inches, wing 4·5, tarsus 0·92, bill from gape 0·7 (*Armstrong*); ♂ (Furreedpore), length 6·75, wing 4·25, tarsus 0·91, bill at front 0·5, weight 1·12 oz.; ♀, length 7·25, wing 4·58, tarsus 0·92, bill at front 0·54, weight 1·37 oz. (*Cripps*); ♂ (Yarkand), length 6·5, wing 4·5, tarsus 1·05, bill from gape 0·6, weight 1·15 oz.; ♀, length 7·0, wing 4·75, tarsus 1·05, bill from gape 0·65, weight 1·7 oz. (*Scully*).

The Marquis of Tweeddale gives the wing-dimensions of seven Luzon examples as 4·25 to 4·5 inches.

European examples range up to 4·7 inches in the wing, and none that I have examined are less than 4·25; the frontal black band *next the bill* is present in all, and does not seem ever to be less than $\frac{1}{10}$ inch in width. I find no difference in specimens from Europe, India, Ceylon, and China, except that as far east as the latter country they seem to average smaller, and perhaps form a connecting-link with the next species.

I do not adopt Scopoli's prior title *dubius*, because his description is founded on an incorrect plate, and consequently does not apply with sufficient accuracy to the species. I have carefully examined Sonnerat's plate; and though it is undoubtedly a representative of a small Ringed Plover, there are mistakes in it which led (on the part of Scopoli) to a decidedly erroneous description, in which we have "*rectricibus nigris, apice albis*," and also "*nigra sunt caput, fascia collaris et caudalis, rostrum, pedes.*" So that we have a bird depicted with a black tail tipped with white, and with a black head, bill, and feet! Gmelin's name *curonicus* was given to Beseke's bird from Kurland, which the latter called *Charadrius*, n. sp.? He refers to it in his 'Vögel Kurlands,' p. 66, gives an accurate description of it, and says that Gmelin has named it *Charadrius curonicus*, which title should reasonably be adopted in preference to Scopoli's.

The present species differs from the larger Ringed Plover of Europe, *Æ. hiaticula*, in having the 1st primary-shaft only white, and also in being, as its name implies, smaller. Examples of the larger bird measure:—wing 5·3 to 5·4 inches; tarsus 0·9 to 1·0; bill at front 0·6. The black pectoral band is broader than in *Æ. curonica*.

Distribution.—This little Plover is, according to my experience, migratory to Ceylon, appearing in the island in September, and departing again in April and May. Mr. Holdsworth considers it to be resident, as he observed it at Aripu during most of the year. I never saw it in the Trincomalie district during the hot weather after the month of May. It is not an abundant species, and is chiefly confined to the north and north-east of the island, and almost always found in the maritime districts. I have not met with it anywhere very far inland. It is not included in my list of birds of the Hambantota district ('Ibis,' 1875); but I think I saw it once or twice in that locality. I did not notice it at Galle; but I have seen it on the beach (not the usual locality for it) at Colombo, and have met with it at Kotte and in the Mutturajawella swamp, and on the islands near Negombo. It is not uncommon in suitable spots in the Jaffna district; but I nowhere saw it in such numbers as between Trincomalie and Tireycyi. It *may* occur far inland on the banks of the Mahawelliganga. Jerdon observes that it is "found throughout India on open plains, ploughed land, dried-up paddy-fields, and the edges of tanks and rivers, as well as on sand banks and churs." Sykes speaks of a Ringed Plover being found on the shores of fresh waters in the Deccan. I have seen two of his specimens in the India Museum, and they belong to the next species with the large naked orbital ring; but it is probable that he also procured the present bird, as Messrs. Fairbank and Davidson both record it from this region;

but the statement of the latter that it breeds from May till December probably applies to the smaller bird. In Sambalpur and Orissa Mr. Ball met with this species, and he remarks that it is common on the larger rivers of Chota Nagpur; he notes it from many places in the Deccan and also from the Rajmehal hills. Mr. Hume obtained it from Raipur, and notices it as occurring near Calcutta in the winter. In Furreedpore it is resident, dwelling all the year round on the banks and churs of rivers; and it has been ascertained to breed on the Ganges at Futtegurh. It is found in Kurrachee harbour, on the rivers of Sindh and the Punjab, in Kattiawar, Kutch, and Jodhpoor in the cold season; and Capt. Butler met with it on the Guzerat plains in the rains. At Sambhur it is common in the cold weather. It was obtained in the delta of the Irrawaddy by Dr. Armstrong, and in Tenasserim it is a cold-weather visitant to the coasts and likewise to inland localities. In the Andamans it is rare, having been only procured by Mr. Davison on South Andaman, and on the Cocos and Preparis. It has been procured in the Malay peninsula and Singapore. In Sumatra Raffles obtained a small Plover which he named a variety of *Ch. hiaticula*, and which we may reasonably consider was this species. In Java it has been obtained by Kuhl, Boie, Van Hasselt, and Horsfield. As regards Borneo, it has been obtained, according to Salvadori, at Tabanio and elsewhere, and more recently Everett shot it at Sibu. Rosenberg procured it in Celebes. Turning north again, we have Luzon in the Philippines assigned by Sonnerat as its habitat; and in 1877 Mr. Everett obtained seven specimens in this island, which the Marquis of Tweeddale relegates to this species. Swinhoe found it in Hainan and Formosa and in the southern part of China in winter, remarking that it breeds in the north of the empire at Talien Bay. In Japan, Blakiston and Pryer record it from Yokohama, Yezo, Tokio, and Fujisan, and say that it breeds at Yamanaka Lake. Schrenck observed it throughout Amoor Land, and found it abundant on the river; Radde met with it at Tarei-nor in April, and says that it is numerous at Lake Baikal in April. Prjevalsky observes that it breeds in South-eastern Mongolia, and states that he found nests in Ordos and Ala-shan; it arrives first at Dalai-nor about the 9th of April, and is rare at Lake Hanka. Dr. Scully writes that it is a seasonal visitant to the plains of Kashgar, arriving at the end of March, breeding in May, and leaving in September; in the Karakash valley he met with it in August at an elevation of 12,000 feet, and mentions the curious fact of getting a young bird in December. According to Severtzoff it breeds all through Turkestan up to 4000 feet. Mr. Hume records it from Muscat and the Mekran coast. Captain Wardlaw Ramsay met with a pair on the Keria river in Afghanistan in June; and Mr. Blanford observed what he took to be this species at Shiraz in Persia; but in the northern parts of the country it is common in summer. Canon Tristram found it in Palestine on the Kishon. It is common in Asia Minor, European Turkey, and Southern Russia, as also in Greece, in all of which countries it breeds. It migrates through Austria to Germany, where it is common; but in Italy it is resident, although only a visitor in Malta, according to Mr. Wright. In summer it ranges as far north as Northern Russia, Finland, and Scandinavia, up to about 60° N. lat., and breeds in Norway, Sweden, and Southern Finland. It likewise nests in Denmark. To England it is a straggler, having been noted as occurring eleven times, according to Mr. Harting; it has not been noticed in Scotland and Ireland, but is said to have occurred in the Faroes. In Northern France it is rather rare, but in the south it becomes more abundant and breeds in that part of the country. In Spain and Portugal it is common. Mr. Saunders found it breeding near Aranjuez; and according to Col. Irby it is more abundant in summer in Andalucia than in winter: he found it common in Morocco. In Algeria it is tolerably common, a few remaining to breed; it has been met with there by Loche and by Messrs. Gurney and Salvin. It extends down the west coast to Gambia and the Gold Coast, and was procured at Accra by Governor Ussher; beyond this it is said to have been obtained near the equator by Du Chaillu. In Egypt and Nubia Capt. Shelley says it is resident and abundant throughout the country both on the rivers and in marshes inland. Further south Von Heuglin met with it on the Nile as far as the equatorial region, and also on the Red-Sea shores; but he says that it is not very common and was only observed by him in the winter. On this side it has been known to stray as far south as Mozambique, and has also been obtained as a solitary straggler in the Mauritius. Mr. Wyatt met with it in Sinai at the marshes of Tor.

Habits.—This little Ringed Plover prefers dry and bare fields, waste land, sandy commons, and similar open localities in which there are small pools of water, near which it runs about, feeding on water-insects, minute beetles, tiny snails, and so forth. It is generally found moving about alone, with a companion or two

at some little distance from it; and I have never seen more than half a dozen in the same locality. On the rifle-range at Trincomalie, which was a favourite resort in the November and December rains, it consorted with a few Lesser Sand-Plovers which were generally to be found in that place; and I have now and then seen a solitary individual or a pair associating, but not in close fellowship, with two or three Kentish Plovers on open places near tidal flats or land-locked harbours; but it is more often seen unaccompanied by other species, and much more frequently near fresh water than brackish. In countries where there are large rivers it frequents their banks, if they be flat and sandy or composed of pebbly reaches, in preference to any other places. It is not shy in its disposition, and when flushed generally takes a short flight and realights. It may always be known in Ceylon from the Kentish Plover by its stature, which is greater than that of the latter; but more particularly by its plaintive monosyllabic whistle, which may be likened to *pēēi, pēēi,* which is uttered generally when it takes flight and occasionally as it runs along on the ground. This note may perhaps consist of a double intonation; but the two syllables sound like one drawn out. Naumann, according to Mr. Dresser, likens it to *diä,* uttered very short, so that the two vowels are almost united. The same author says that "the pairing-note or song begins slowly and is closed with a peculiar trill like the syllables *düh, dü, düll, lüll, lüllüllüll.* This note is only heard at the breeding-place, and is more frequently uttered by the male, more seldom by the female, when seated as well as when on the wing, but most frequently when performing the aerial evolutions in which the bird so frequently indulges during the pairing-season."

Nidification.—The Lesser Ringed Plover breeds freely in the northern parts of India as well as in Turkestan and Central Asia. Its nest has been found in the Etawah district, on the Mahanadi, in the Deccan (*Burgess* and *Davidson*), in Manbhum, at Nerbudda, at Islamabad, and on the Jhelum in Cashmir between the month of March and the middle of May. Mr. Hume describes the nest as "a tiny depression scraped, not far from the water's edge, in sand or very fine shingle, by choice on some water-encircled bank, occasionally on some unfrequented part of the river-bank itself. In this, on the bare sand or pebbles, four eggs are laid." He observes that the eggs are imitations of the Kentish Plover's, broad ovals, pointed towards one end, of a "drab fawn- or buff stone-colour," and sometimes of a pale greenish grey, thinly speckled or marked with little hieroglyphic-like lines and figures of brownish purple, blackish brown, or black, beneath which are underlying markings of pale inky purple. They vary in length from 1·1 to 1·23 inch, and in breadth from 0·8 to 0·87.

Concerning its nidification in Europe, we gather from Mr. Dresser's great work that "it nests in places where there is pebbly ground, like those selected by *Ægialitis hiaticula,* and not in localities where there is sand without a strong admixture of small stones. The nest is a mere depression in the ground amongst the stones; and the eggs, which are deposited about the middle of May, are four in number, and are, like those of other Waders, placed with the point inwards." Mr. Robson informs Mr. Dresser that "they have many breeding-places on the coast of the Black Sea, both on the European and Asiatic sea-board, in situations where valleys debouch towards the ocean, their wide fronts covered with sand and pebbles, with shallow streams of fresh water trickling over a narrow surface towards the beach. In natural cavities in the shingle these birds lay their eggs; and in shallow streams near the sea they find their food, water-beetles and the larvæ of insects that come down from the mountains in numerous small streams that unite as they near the coast. . . . . On its eggs being approached by man it steals off a short distance, curves its head and tail downwards, and runs in irregular lines, much like a small animal, to decoy the intruder away from its eggs, which result being accomplished, it rises into the air, making a distant whirl, uttering its piping cry, and, gradually lessening the circuit of its flight, alights on the sands and waits a favourable opportunity for returning to its eggs."

A series which I have examined from European localities, in Mr. Dresser's collection, procured in Hungary and South-eastern Europe, are stone-grey, stone-yellow, and some pale brownish clay-colour, marked with small spots and streaky marks of blackish sepia and brown over specks of light lilac or bluish grey; the colouring is pretty evenly though very openly distributed over the eggs, and the linear marks are not so large or so numerous as on those of the Kentish Plover. In some the secondary markings take a linear form. They measure 1·23 by 0·87 inch, 1·15 by 0·73, 1·13 by 0·84. They are broad pointed ovals in shape.

ÆGIALITIS JERDONI.

(THE LITTLE INDIAN RINGED PLOVER.)

? *Charadrius philippensis* (Lath.), Sykes, P. Z. S. 1832, p. 166; Jerdon, Madr. Journ. 1840, xii. p. 212.

Ægialitis minutus (Pallas), *apud* Jerdon, B. of Ind. iii. p. 641 (1864); Legge, Str. Feath. 1875, p. 372 (first record from Ceylon); Hume, ibid. 1877, p. 212, et 1878, p. 456 (B. of Tenass.).

Ægialitis philippinus (Lath.), Hume, Str. Feath. 1875, p. 179.

Ægialitis minuta (Pallas), *apud* Hume, Str. Feath. 1878, vii. p. 227; Cripps, *t. c.* p. 300; Hume, ibid. 1879, p. 112 (List B. of Ind.).

Ægialitis jerdoni, Legge, P. Z. S. 1880, p. 39.

Adult male and female (Ceylon). Length 6·25 to 6·4 inches; wing 3·9 to 4·25; tail 2·0 to 2·2; tarsus 0·95 to 1·0; middle toe and claw 0·66 to 0·72; bill to gape 0·55, at front 0·45 to 0·50.

In a series of 3 males and 2 females the latter are the smaller.

Iris deep brown; eyelid, which is thick, protuberant, and "corrugated," primrose-yellow; bill black, *basal half* of lower mandible and a spot at the base of the culmen yellow; legs and feet plumbeous, the centre of the tarsus yellowish (in dried specimens the legs turn to a yellowish colour throughout).

Adult male (Kanthelai: August). Back of head, back, wings, scapulars, and tertials light hair-brown; the basal colour of the tail-feathers is a paler brown than in the last species, showing the dark terminal portion as a band; the loral band is narrower than in the last, and the black does not cross the point of the forehead, which is entirely white to the base of the bill; the black postfrontal band is very broad, and the pectoral band rather narrow, but the black at the back of the neck is rather broader in proportion than in *Æ. curonica*.

Not having procured any specimens of this Plover in the cool season, I am unable to say what the winter plumage is; but it cannot, as a matter of course, differ from that of the last.

Immature. An example shot on the 4th of August at Kanthelai, and in very abraded plumage, has the feathers of the head and back narrowly tipped, and the scapulars and tertials somewhat deeply margined, with brownish rufous. Two others, shot at the same date, have this colour only at the tips of the tertials. This would appear to be the plumage at the end of the first year, just before the second moult.

Obs. There can be no question as to whether this species is distinct from the last, although it comes so close to it that it may only be entitled to the rank of a *subspecies* or *small race*. Its smaller size (the largest specimens only equalling the smallest of *curonica*), the absence, or the very small amount, of black, extending from the lores across the base of the bill, the more conspicuous yellow coloration of the bill, and (in the breeding-season at any rate) the remarkably *protuberant and corrugated fleshy* orbital circle, quite different from the *plain naked* eyelid of *curonica*, will always serve to distinguish it from the latter bird. Jerdon recognized some of these distinctions, and included with them the less lengthened tertials, which is not a reliable characteristic; he likewise stated that the quills were blacker, and the upper plumage of a somewhat darker shade; but neither of these features am I able to discover. I may likewise remark (as some authors have been unwilling to allow the distinctness of this species) that Blyth recognized it, and in a paper in the 'Field,' May 1870, remarked that the little Ringed Plover of South India was peculiar for the much broader naked yellow orbital ring. Jerdon applied to this species Pallas's title *minutus*; and this has been in vogue in India ever since. This was a name given by Pallas, in his 'Zoographia Rosso-Asiatica,' to a small Plover which was obtained on lakes in the steppes of Barabinski, a region lying between the rivers Ob and Irtish. The description is that of a young bird, as the forehead is said to be whitish, no mention being made of any dark coloration, and the feathers of the upper surface are described as pale-margined. The length of the wing is given as 3·6 inches only, too small for adults of the present diminutive species even; and I agree with Mr. Harting in considering this *Charadrius minutus* to be nothing more than the young of

Æ. curonica, which is found in the district in question. The only other name which has been applied to our bird is *Charadrius pusillus*, Horsfield, given to a species which he described from Java. In 'The Ibis' for 1867, Blyth stated that he had examined the type specimen, and found that it was *Ægialitis ruficapilla*; but in this determination he appears to have been in error; for Mr. Harting has kindly shown me a skin of an immature *Æ. curonica* (wing 4·4 inches) from Formosa, which he says is a facsimile of the Javan type in question, which he examined some years ago. It is necessary, therefore, to propose a new name for this little Ringed Plover; and there can, perhaps, be none more suitable than *jerdoni* *, in honour of the great Indian naturalist who was the first to recognize the distinctness of the species.

I have examined specimens obtained by Mr. Anderson in the Futtegurh district, identical in size and markings with my own, and with the same protuberant orbital ring. Mr. Cripps contributes data of a male shot in Furreedpore as follows:—"Length 6·75 inches; wing 4·08; tail 2·1; tarsus 0·92; bill at front 0·46; weight 0·87 oz. Eyelids yellow; legs bluish grey; irides dark brown; bill, base below and gape yellow." In one skin of Mr. Anderson's there is a black edging at the base of the bill; in another the forehead is entirely white, as in my own skins from Ceylon. There is a male example in the Swinhoe collection which has much yellow at the base of the bill, and which, judging by its small size, appears to belong to this smaller form. There is, however, no appearance in the dried specimen of the broad orbital ring. It is an April bird, and measures—wing 4·2 inches, tarsus 0·85.

Distribution.—It was not until the hot season of 1875 that I met with this, the smallest of Ringed Plovers; and as I have not observed it in the cool weather, I cannot state positively that it is resident in the island; but the natural inference to be drawn from the fact of its breeding in Ceylon is that it is a permanent species there. I discovered it on the shores and about the creeks and flat land on the borders of Kanthelai and Minery tanks; and these are the only localities in which I found it. At the former place I did not see it during a subsequent visit in the cool season; but I did not explore the whole of the ground formerly passed over; and to the latter tank I made no trip after the date in question. It remains for future workers in Ceylonese ornithology to discover whether it is a permanent resident, and likewise to satisfactorily identify its eggs.

It appears to be a scarce bird in India. Sykes, in his catalogue of Deccan birds, says it frequents the shores of fresh water there, and is frequently killed in company with "*Sandpipers*;" the latter remark may, however, refer to the last species. From Raipur Mr. Hume has received it; but it is not enumerated in the Chota-Nagpur list of birds. It has not been observed in the Calcutta market, which is sufficient evidence as to its general absence from that locality; but in Furreedpore Mr. Cripps met with a party of four on one occasion, on a sandy chur. In the west of India Captain Butler procured it once at Deesa; and Major Hayes-Lloyd speaks of "*Æ. minutus*" as being common in Kattiawar; but this statement doubtless refers to the last species. From Pegu Mr. Oates sent to Mr. Hume a specimen of a Ringed Plover, which the latter says belongs to this species; it is said to be common on the banks of the Irrawaddy and large nullahs in the cold season; but it was not noticed during the rains. In Tenasserim a single pair were met with by Mr. Davison inland. Whether it extends to the south and into the Malay archipelago, further research will no doubt decide; but as yet I have no evidence of its occurrence lower down the peninsula than the province of Tenasserim.

Habits.—I found this species frequenting the shingly beds of the rivers which supply the great Kanthelai tank with water in the wet season; it likewise affected the dried-up muddy shores of the tank; and at Minery I found it also on the borders of the lake. All I saw were breeding, and their actions were those of the rest of the genus during the time of nidification. They were very tame, and when they were frightened from the spot by my approach, they flew round and settled down behind me, or making wide circles round the spot where I stood would realight in their original position. They ran with considerable speed, and possessed the upright deportment and elegance of action which is characteristic of the last species. Their note differed,

* I must mention here that when exhibiting specimens of the species at a meeting of the Zoological Society a few days since (Feb. 3rd), and suggesting another name for it, the Secretary of the Society recommended my adopting the name *jerdoni*.

however, being a mellow whistle, which, when I approached the vicinity of where they appeared to be nesting, was uttered more loudly and with a sharp finish. In flight they resembled their larger relative.

Nidification.—All my endeavours to find the nest of this species, by putting the bird off it, or by tracing it to the vicinity of its eggs, and then discovering them, were unsuccessful; and I am of opinion that the birds for whose nests I searched had young concealed in the grass or among the stones. However, while taking the eggs of the Stilt and the Kentish Plover on the island mentioned in a former article, I discovered two nests containing eggs different to those of the latter, and which, in all probability, belong to the present species. There were no little Ringed Plovers on the island at the time I found the nests; but they may have flown off when I approached, and might easily have passed unnoticed among the hundreds of Stilts, Kentish Plovers, and Little Terns which were thronging the air and the neighbouring shores in the usual state of excitement manifested when a large breeding-colony is invaded. The nests were situated in strips or deposits of flood-"wreck," in which little hollows were scraped, and lined with little pieces of dried grass, stick, &c. The eggs were three in number, of a brownish-olive or dusky clay-colour, marked round the larger end with a zone of irregular blackish spots and short streak-like marks, with which the rest of the surface is sparingly covered; others were spotted openly throughout with regular-edged blotches of black, under which were spots of inky grey. In shape they are broad ovals, pointed at the small end, but not compressed, resembling, in fact, the eggs of the Kentish Plover in form. They vary in size from 1·17 to 1·15 inch in length by from 0·85 to 0·84 in breadth.

GRALLÆ.

CHARADRIIDÆ.

Subfam. VANELLINÆ.

Bill formed as in the last subfamily, but slightly longer. Wings lengthened, as also the legs. Hind toe absent or present rudimentarily.

A spur at the point of the wing in nearly all. Face ornamented with lappets in many. Sternum with two notches in each half, the outer wide and deep, the inner round and closed like a foramen.

Genus CHETTUSIA.

Bill moderate, straight, compressed; the tip horny and elevated; nostrils linear, in a long groove continued to the horny tip. Wings long, pointed; the 1st or 2nd quill the longest; tertials lengthened; a rudimentary tubercle at the shoulder. Tail moderate, even, of 12 feathers. Legs long and tolerably robust. Tarsus covered with reticulated scales, and twice the length of the middle toe; outer toe connected at the base to the middle by a web; hind toe and claw minute.

CHETTUSIA GREGARIA.

(THE SOCIABLE LAPWING.)

Charadrius gregarius, Pallas, Reise, i. p. 456 (1771).

Chettusia gregaria (Pall.), Bp. Iconog. Faun. Ital. Ucc. Introd. p. 115 (1832); Jerdon, B. of Ind. iii. p. 646 (1864); Saunders, Ibis, 1871, p. 386; Holdsw. P. Z. S. 1872, p. 471 (first record from Ceylon); Hume, Str. Feath. 1873, p. 231; Shelley, B. of Egypt, p. 233; Von Heuglin, Orn. N.Ost-Afr. ii. p. 996 (1873); Dresser, B. of Eur. pt. 37 (1875); Butler & Hume, Str. Feath. 1876, p. 11; Davidson & Wender, ibid. 1878, vii. p. 88; Hume, ibid. 1879, viii. (List Ind. Birds), p. 112.

Charadrius wagleri, J. E. Gray & Hardw. Ill. Ind. Zool. pl. 50 (1835).

Charadrius ventralis, Jerdon, Cat. B. S. India, Madr. Journ. 1840, xii. p. 214.

Vanellus gregarius (Pall.), Gould, B. of Eur. iv. pl. 292 (1837).

Sociable Plover of some authors; *Black-sided Plover*.

Adult male, summer plumage (Russia). Wing 8·3 inches; tail 3·7; tarsus 2·5; middle toe 1·1; bill to gape 1·3.

Iris brown; bill black; legs and feet black.

Head, nape, and a band from the gape through eye black; forehead and a broad band over the eye to the nape, as also the chin and gorge, white, changing into the rufescent sand-colour of the sides of the neck and ear-coverts; neck below the rufescent colour, chest, interscapulars, and wing-coverts brownish stone-grey, slightly glossed and blending into the rufous of the neck; lesser wing-coverts darker than the rest; secondaries and terminal portion of the greater wing-coverts white; primaries and their coverts black; winglet blackish brown; the edge of the wing pale brown; rump, upper tail-coverts, and tail white, with a large black patch near the tips of the four central pairs of feathers; breast black, changing into rufous on the abdomen; vent, under tail-coverts, axillaries, and under wing pure white.

Female (South Altai Mountains). Head not so black, the loral stripe scanty; more white on forehead, face, and throat; the chest much paler, and darkening into *blackish* on the breast, the feathers beneath this pale rufous. Wing 7·8 inches. This, I believe, is the usual plumage of the female; but Mr. Dresser speaks of an example in Mr. Harting's collection as being as highly coloured as any male. The breeding-plumage is assumed throughout India in the month of February.

Winter plumage (N.W. Provinces, November 1873). Forehead, lores, and superciliary stripe buffy white; head dark brown; a black stripe behind the eye: face and ear-coverts sandy brown; upper plumage with the feathers finely edged with pale grey; wings, rump, and tail as in summer; chest greyish brown, the feathers pale-edged; chin and throat white, as are also the lower breast and abdomen. This example has some black feathers on the crown, and is acquiring new tail-feathers, which looks as if the head turned black in early winter. The black and rufous underparts cannot well be characteristic of the adult winter plumage, as birds are never seen with them in India until the month of February, when this dress is first assumed. The tail-band extends in some to the penultimate feather.

Nestling. "Head and upper parts white, on the forehead, crown, and back washed with ochre; crown and upper parts spotted and blotched with blackish; the entire underparts white." (*Dresser*, descr. of pl. 10, Rev. et Mag. Zool. 1870.)

Immature (17th October, Colombo). Length 12·0 inches; wing 8·0; tail 3·4; bare tibia 1·2; tarsus 2·3; middle toe and claw 1·2; bill at front 1·18.

Forehead and broad supercilium buff-white; occiput and nape dark brown, intermingled with black feathers, which cover the crown, and are tipped with white next the forehead; lores, face, and ear-coverts dusky buff, the feathers with dark shafts; a black edging in front of the eye, and a narrow streak behind it; hind neck brown; inter-

scapular region blackish brown; the whole tipped with *rufous-buff*; scapulars and wing-coverts tipped with the same hue, but brown as regards the rest of the feather; centres of the chest-feathers black, the edges buff. The marginal coloration of the upper surface is very different in this example from the adult above described.

Obs. *Chettusia villotæi*, Audouin, the nearest ally of this bird, has the forehead and throat white, paling into light stone-grey on the head; the back and coverts light brown, with a pinkish tinge; the greater coverts and secondaries white, with a band of black above; primaries, rump, tail, and underparts white; chest brown and asky. Wing 6·7 inches; tarsus 2·2. Bill black, legs and feet yellow (S. Persia).

Distribution.—This fine Plover has been only twice procured in Ceylon; on the first occasion by Mr. Bligh, on the Galle face at Colombo, during the cool season about ten years ago, and on the second by Mr. MacVicar in the same spot on the 17th October, 1873. These are the only instances of its ranging so far south as this island with which I am acquainted; but it may perhaps have been shot by collectors in the north and have escaped notice.

In India its distribution is local, and it is confined to the western side of the peninsula. The most southerly point at which it has been noticed is the Deccan district, in some of the western parts of which it is, according to Messrs. Davidson and Wender, common during the cold weather. I have specimens sent me by the late Mr. A. Anderson from the North-west Provinces, and I fancy that westward of that part it is not uncommon. In the Sambhur district, observes Mr. Adam, it is not very common, being met with sparingly about the plains in the cold weather. In Sindh Mr. Hume often observed it, sometimes about the jheels, but more commonly on waste dry uplands near cultivation; and he remarks that it is common in the cold season all through Jodhpore, Guzerat, Kutch, and Kattiawar. In the neighbourhood of Deesa, writes Captain Butler, it is abundant during the cold weather, congregating in flocks, which vary in number from four or five to fifty or sixty; but it is not so plentiful further south. The date of its arrival he chronicles as the 3rd of October and of its departure as the 10th of March. In Oudh and Kumaon Col. Irby found it very abundant in sandy plains. On leaving India it passes through Turkestan, according to Severtzoff, being met with in the south-eastern and northern portions of the country up to an altitude of 4000 feet. Dr. Scully did not see it in the Kashghar district of Turkestan; but it ranges to the north of that region, as I have seen a specimen (above described) from the South Altai Mountains, in about lat. 47° N., and most probably it breeds extensively between that part of Central Asia and the sea of Aral. It was procured by Pallas in these latitudes; but it does not range as far north as Siberia. It has not been *observed* in Persia, nor in Palestine or Asia Minor, but it must needs pass through the former country on its way north to Europe; at any rate it passes into Arabia, for Mr. Wyatt met with it on the plain of Er Ráhah in the peninsula of Sinai. It is rare in Egypt, where Captain Shelley only twice met with it. Von Heuglin writes that it visits North-east Africa regularly in autumn and winter, arriving in Egypt at the beginning of October, and making its way thence southwards to the savannas of Kordofan, Sennaar, and Takah, in flocks of five to fifteen individuals. It appears to migrate into Europe by way of the eastern shores of the Caspian to the Ural and the Volga, and westwards by way of Persia along the south of the Caucasus and across the Black Sea to the Crimea, where Von Nordmann saw large flocks of it. It does not, therefore, range in its journeys so far west as Turkey, and it has not been seen in Greece. In the Ural Mountains, where it no doubt breeds, it ranges on the eastern slope as far north as $59\frac{1}{2}°$ N.; and on the Volga it has been met with as far as lat. 53°, in which latitude Bogandoff met with it on the Medvediza, a tributary of the Don. It has strayed as far west as Poland, for there is a specimen in the Warsaw Museum killed near Lublin. It has not occurred elsewhere in Central Europe; but according to Mr. Saunders, *loc. cit.*, it has visited Spain, as he asserts that he met with a half-putrid example in the market of Cadiz in February 1868.

Habits.—The Sociable Plover, as its name implies, lives in flocks of from half a dozen to a hundred or more, and affects plains, waste land, open commons, barren country near cultivation, and sometimes the vicinity of jheels. It is interesting that both specimens which have been procured in Ceylon should have been found on the Galle face, which is a very public locality, but, nevertheless, a very favourite resort of various Plovers. Mr. Hume remarks that it is fearless and tame until shot at once or twice; but Von Heuglin

found it very shy in the savannas of Kordofan and Sennaar; it frequented sandy localities and ground that had been burnt; he observes that they seldom alighted on the ground, but mostly moved in quick low-flying flocks over the plains, sometimes crossing the caravan-roads, which gave him an opportunity of shooting several from horseback; otherwise it was not possible to get near them. They were, as a rule, quite silent; but now and then he heard it utter a shrill, short whistle. He found its food to consist of grasshoppers, spiders, beetles, and larvæ. In Sindh this Plover seems to be a favourite quarry of the Laggar Falcon. Capt. Butler, writing of a pair of these Falcons and a flock of Lapwings, remarks that when the latter saw their enemies approaching they "used to rise in a flock closely packed together to an immense height in the air, wheeling and darting in all directions. It was of no use, however, trying to escape, the two Falcons would follow them up until an opportunity occurred, and then one of them, with a velocity beyond description, would make a stoop into the midst of them and strike its victim, descending with it in its claws slowly to the ground."

Nidification.—Little is known respecting the nesting of this species. Mr. Dresser describes an egg sent to him by Mr. Möschler, taken near Sarepta, as closely resembling those of the common Lapwing, but somewhat paler in ground-colour, and more sparingly marked with spots and blotches.

Genus LOBIVANELLUS.

Bill much as in the last genus, but longer; a lappet of nude red skin proceeding from the anterior corner of the eye and impending the lores. Shoulder furnished with a tubercle, which develops at the breeding-season. Tail as in *Chettusia*; legs longer and more slender. Tarsus nearly three times as long as the middle toe; outer toe attached to the middle at the base; hind toe and claw very small.

LOBIVANELLUS INDICUS.

(THE RED-WATTLED LAPWING.)

Tringa indica, Bodd. Tabl. Pl. Enl. p. 50 (1783).

Parra goensis, Gm. ed. Syst. Nat. i. p. 706 (1788).

Vanellus goensis (Gm.), Sykes, P. Z. S. 1832, p. 165; Gould, Cent. Him. B. pl. 28 (1832); Jerdon, Madr. Journ. 1840, xii. p. 214.

Lobivanellus goensis (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 261 (1849); Kelaart, Prodromus, Cat. p. 132 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 109; Jerdon, B. of Ind. iii. p. 648 (1864); Legge, Ibis, 1874, p. 27, et 1875, p. 401.

Lobivanellus indicus (Bodd.), Schlegel, Mus. P.-B. *Cursores*, p. 68 (1864); Holdsw. P. Z. S. 1872, p. 472; Hume, Str. Feath. 1873, p. 232; Ball, ibid. 1875, p. 209; Hume, Nests and Eggs, iii. p. 574 (1875); Butler & Hume, Str. Feath. 1876, p. 14; Hume, ibid. 1878, vii. p. 67; Davidson & Wender, *t. c.* p. 88; Ball, *t. c.* p. 227; Cripps, *t. c.* p. 300; Hume, ibid. 1879, viii. p. 112 (List B. of India).

Goa Sandpiper, Gmelin; *Indian Lapwing, Plover, Pewit*; "*Pity to do it*," "*Did you do it?*" Sportsmen, from their cry. *Titai, Titi, Tituri, Titiri*, in different parts of India; *Yennepa chitawa*, Telugu (Jerdon); *Verklikker*, Dutch in Ceylon; *Al-kati*, Ceylonese Tamils, lit. "Man pointer."

Kiralla, Kibulla, Sinhalese.

Adult male and female (Ceylon). Length 12·6 to 13·0 inches; wing 8·0 to 8·4; tail 3·9 to 4·3; tarsus 3·0 to 3·1; bare tibia 1·5; middle toe and claw 1·2 to 1·42; bill to gape 1·3 to 1·4; spur, in the breeding-season, 0·2. Females are the smaller.

Iris brick-red or greyish red, paling at the outer edge; orbits, lappets, and two thirds of bill from base coral- or lake-red (the bill often inclining to pink); remainder of bill black; tibia yellow; tarsus sickly or greenish yellow; toes greenish yellow, claws black; alar spur reddish.

Head, hind neck, face, throat, fore neck, chest, quills, and a broad band across the tail glossy black, the wings and tail not so intense as the head and neck; a broad band passing from the posterior margin of the eye over the ear-coverts, down the sides of the neck and chest, together with the under surface, under and upper tail-coverts, and tail, tips of greater wing-coverts, and most of the secondaries white; lower part of hind neck, back, rump, wing-coverts, and tertials pale brown, with a strong green lustre, and glossed with amethystine on the wing-coverts and scapulars; the white of the secondaries increases towards the innermost feather, which has only the tip black, and the adjacent tertiary is all white. The amethystine hue varies in individuals, extending in some to the back and longer tertials.

Young. The immature bird in first plumage has the iris brown, base of bill reddish, remainder black; the lappets partially developed. Forehead and lores greyish; crown brownish; the chin and throat white, in some mottled with fulvous, and the surrounding plumage of the neck dull black; the upper surface and wings duller than in the adult, with fulvous edgings to the feathers.

Some examples in what may be a further stage have the iris "traced" with brown pencillings, and the white of the under surface tinged with buff.

Obs. A comparison of a fine series of this bird in the national collection demonstrates that continental examples are somewhat longer in the wing than Ceylonese. Specimens from Kamptee, Nepal, and other districts measure:—8·6 to 9·2 inches; tail 4·5 to 4·8; tarsus 2·8 to 3·1; bill to gape 1·3 to 1·4.

In the green and vinous tints of the upper surface, the breadth of the white side neck-streak, marking of tail, &c. they correspond with my skins.

L. atronuchalis, Blyth, the Burmese representative of this species, is *closely* allied to it, differing in the black of the hind neck being of greater extent and ending abruptly at the lower part next the back, where there is a white band, and also in the side neck-stripe being narrower and shorter, ending a little below the ear-coverts. Wing 8·5 inches; tail 4·3; tarsus 3·1 (Brit. Mus.).

In Australia are two species of this genus, *L. lobatus* (Vieill.) and *L. personatus*, Gould. The former has very large wattles; in a specimen shot by me they measured, before shrinking, 1·3 inch in length, wing 9·9. Head, neck, and sides of chest black; upper surface greyish brown; wings black, beneath white. The latter species is the North-Australian representative of *L. lobatus*, differing in having the entire neck white, the top of head only black, and the wattles extending more over the face and more pointed at the tips.

Distribution.—This Lapwing, though widely distributed throughout the low country, is somewhat partial in its choice of locality. It is very common in the northern half of the island, as also in the north-western and better-watered eastern districts, being in these parts found at almost every tank and jungle-begirt paddy-field that one visits. In the Western Province it is also abundant, but is chiefly found on pasture-land; and about Bolgodde frequents marshes and the drier portions of large paddy-fields. In the Amblangoda, Wack-wella, and Baddegamma fields and pastures, as also about Matara, it is to be met with in moderate numbers, and is likewise seen further east towards Tangalle and beyond that place. In the dry maritime region of Hambantota the next species takes its place principally, though it may there be met with about tanks and marshes in the jungle. Further north, in the Wellaway Korale it is again more common, and ascends the hills near Lemastota to a considerable altitude. It is also to be found on the Uva patnas at times, where Mr. Bligh has seen it near Banderawella at an altitude of about 4000 feet. It likewise frequents suitable localities in Dumbara, but, I understand, chiefly in wet weather, when it is a visitor to that upland from the low country.

In India it is, writes Dr. Jerdon, one of the best-known birds in the country, extending from the extreme south up to Cashmir, to the west of which, in the Suliman hills, Mr. Ball met with it in the higher valleys up to an altitude of 3500 feet. In the Persian Gulf Captain Butler procured it on the island of Henjam. In the north-western corner of the peninsula, composed of Cutch, Kattiawar, and Guzerat, it is common, and in Sindh is everywhere abundant, though not so much so, according to Mr. Hume, as in the North-west Provinces. About the Sambhur Lake it is, says Mr. Adam, very plentiful, breeding there from March until July. In Guzerat, Captain Butler finds that it is to some extent migratory, being scarce in the hot weather. In Oodey-pore Mr. Hume met with it at Kunkrowlee Lake in February; and in Jodhpoor, during the prevalence of a drought in the cold season of 1877–78, he found one or more pairs about every hamlet. In the north-west, as also in the lower provinces of Bengal, it is common. In Furreedpore Mr. Cripps found it to be a permanent resident; but further east it becomes scarce, for in North-east Cachar it is only a straggler in March and April, and in Burmah it is replaced by the allied species above mentioned. Mr. Ball records it from most places in Chota Nagpur, from Orissa (north of the Mahanadi), and from the Godaveri valley. In the Deccan it is abundant, and is found, says the Rev. Dr. Fairbank, by every stream in the Khandala district. In the south it is found in the hill-country of Travancore, and in the lowlands is, I imagine, common.

Habits.—This is one of the most well-known Waders in Ceylon, taking there the place of the equally familiar Lapwing in the British Isles. In common, however, with many other species which are so very tame and familiar in India, it is not so fond of the vicinity of human habitations as it is on the mainland; for although it may be found on pasture-land surrounding villages and hamlets and even close to cottages, it prefers more unfrequented localities, such as the borders of paddy-fields, edges of marshes, meadow-land surrounding large tanks, or the margins of the smaller village ones. Though not strictly a shy bird, it is wary enough to rise when approached before one is within shot of it, and then, when flying round the place from which it has been disturbed, uttering its well-known cry in true Lapwing fashion, it manages to keep at a respectable distance from the intruder. When on the wing or when approached while on the ground, particularly at night, it is constantly uttering its harsh and rather amusing notes; these consist of a shrill cry, followed by others resembling the words "Pity to do it," "Did you do it?"—which are particularly annoying to the inexperienced

sportsman, as they are always vociferously given out after having been fired at and missed! At night it is a most watchful bird, and ever ready in the jungle to alarm slumbering nature around it with utterance of these cries. When watching for deer, on a moonlight night, behind an ambush, or, as it is called in North Ceylon, a "shade," of newly-cut boughs, and employed in the somewhat monotonous sport (?) of intently gazing through a small opening in my lair at a water-hole some fifteen yards in front of me, I have had these troublesome birds run close up, and, finding me out, rise with loud cries of "Pity to do it;" and whether it was a pity or not to do it, I used to find that after this alarm the deer gave the water-hole a wide berth, and did not come to drink! Layard alludes to this habit of annoying the native tank-shooters, by whom, it may be remarked, the market at Trincomalie used to be supplied with venison; and in India the same notes have gained for it its popular name of "Did you do it?" Jerdon observes that in the "south of India it is recorded to sleep on its back with its legs upwards; and the Indian proverb '*Tititira se asman thama jaega*,' &c., 'Can the Pewit support the heavens,' is applied to a man who undertakes some task far above his strength." The flight of the Indian Lapwing very much resembles that of our own home bird, being performed with vigorous beatings of its ample wings; but it does not twist and tumble about in the air so much as the latter. Its food consists of worms, crickets, beetles, and aqueous insects; and it may not unfrequently be found in newly-burnt clearings in the low country jungles searching for larvæ &c. in the charred and blackened soil. Col. Sykes records the finding of corn in its stomach. When pressed by hunger it feeds on offal even, concerning which degraded taste Mr. Hume writes, in speaking of its habits during a drought in Jodhpore:—"Strange to say, the Lapwings had taken up their abode, like the madmen of old (and mad they must have been to cling to such a place as Jodhpore was when I was there), 'amongst the tombs.' Outside each village is a bovine Golgotha, to which all the carcases of the cattle which die are, after being skinned, dragged—first, apparently, to ensure a pleasant smell (from a native point of view), and, secondly, for the delectation of the village dogs, the jackals, and vultures. Now at this time of drought it was invariably amongst the skeletons, generally inside the ribs of some hapless and diseased bullock, that I found *L. indicus* (a veritable disgrace, as I remarked to some of them, to their genus), feeding on fly-maggots and small fragments of putrid flesh."

Nidification.—This Lapwing breeds in the Western Province in May, June, and July, and in the latter month I have taken its nest at Hurullé tank, not far from Anaradhapura. It chooses an elevated spot in a meadow, a bund in a paddy-field, or a dry place in a marsh or weedy tank, and scrapes out a hollow in the soil, which is sometimes lined with little rounded pellets of mud, which have the appearance of being made by the bird with its bill; amongst these are mixed some dried grass-stalks cut up into short pieces, and tiny twigs or fragments of leaves. The interior of the nest is sometimes of the same colour as the eggs, which are generally three in number and of a stone-grey or olive colour, much stained or clouded with dusky bluish grey, and over this thickly covered with short streaks, blotches, spots, and markings of all shapes of blackish sepia, which are thickest round the large end. They are pyriform in shape, and rather small for the size of the bird. A small series in my possession measure 1·62 to 1·71 inch in length, and 1·15 to 1·2 in breadth. When frightened from her eggs the parent bird stealthily leaves the nest and flies to a little distance, alighting and running to and fro; but when young are concealed in the grass the old birds are very noisy, flying round and round with loud cries. In India, particularly in the wet season, when its usual haunts are flooded, this Plover resorts to all kinds of places to nest, and manifests an utter disregard of man. Mr. Hume, after mentioning that it breeds throughout India in the plains and hills up to 4000 feet, writes, in 'Nests and Eggs,' as follows:—

"The breeding-season lasts from March to August, and I rather suspect that they have two broods; but I am not sure, for the great bulk of the birds lay in April, May, and June. . . . . They lay almost anywhere, provided there is water somewhere in the neighbourhood. Banks of rivers, edges of swamps or ponds, well-irrigated gardens, are their favourite nesting-sites until the rain falls; after the rains have well commenced they like drier situations. It is very usual then to find their eggs amongst the ballast of a railway (often in such a situation that the footboard of every carriage passes over the bird's head) or on the top of a hedge-bank, in an old brick-kiln, or in any well-drained situation; in fact a pair that had frequented my garden all the cold season at Mynpooree, laid on the top of my flat-roofed two-storied house and hatched their young there, and the second day had the young down in the garden. How they carried them the 40 feet from the

parapet of the roof to the ground I could not ascertain. These particular eggs had been kept in their places on the flat roof by a circle of fair-sized pieces of mortar, heavy enough to resist the strong winds which often in Upper India usher in the rainy season. Very generally the eggs are laid in a simple depression in the earth; but not unfrequently the hollow is surrounded by a little circle of stones or a little ridge of sand."

The ground-colour in a large series is in some reddish buff, and in others coffee-coloured, or again pale olive-green. The average size of a large series is, writes Mr. Hume, 1·64 by 1·2 inch.

Genus LOBIPLUVIA.

Bill shorter and wider at the base than in the last; base of the lappets extending from the eye to the culmen. Wings long, much pointed, when closed reaching beyond the tail; the 2nd quill the longest, 3rd as long as the 1st. Tail of 12 feathers, shorter than in *Lobivanellus*, even at the tip. Legs long and slender; toes short; hind toe wanting.

LOBIPLUVIA MALABARICA.

(THE YELLOW-WATTLED LAPWING.)

Charadrius malabaricus, Bodd. Tabl. Pl. Enl. p. 53 (1783).

Charadrius bilobus, Gm. ed. Syst. Nat. p. 691 (1788).

Vanellus bilobus (Gm.), Sykes, P. Z. S. 1832, p. 208; Jerdon, Madr. Journ. 1840, xii. p. 213.

Sarciophorus bilobus (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 261 (1849); Jerdon, B. of Ind. iii. p. 649 (1864); Blyth, Ibis, 1867, p. 165; Beavan, Ibis, 1868, p. 390; Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 108; Morgan, Ibis, 1875, p. 323; Legge, *t. c.* p. 407.

Sarciophorus malabaricus (Bodd.), Holdsw. P. Z. S. 1872, p. 472.

Lobipluvia malabarica (Bodd.), Hume, Nests and Eggs, iii. p. 577 (1875); Butler & Hume, Str. Feath. 1876, p. 14; Davidson & Wenden, ibid. 1878, vii. p. 88; Ball, *t. c.* p. 227; Hume, ibid. 1879, viii. p. 112 (List B. of Ind.).

Jithiri, N.W. Prov.; *Al-Kati*, Tamil (Jerdon); *Zirdi*, Hind.; *Verklikker*, Dutch in Ceylon; *Teteue*, Portuguese in Ceylon (Layard).

Kirella, Sinhalese.

Adult male and female. Length 10·5 to 11·25 inches; wing 7·7 to 7·8; tail 3·0; tarsus 2·3 to 2·4; middle toe and claw 1·0 to 1·1; bill to gape 1·25, at front 1·0.

Iris yellowish or grey, with a brown outer edge; eyelid and wattles lemon-yellow; bill black, greenish yellow at the base; tibia and tarsus yellow; feet dingy yellow, claws black.

Top of the head and nape black, bounded by a white border running round the nape from the posterior corner of the eye; hind neck, back, scapulars, and wing-coverts pale earth-brown, passing into a lighter or greyer hue over the fore neck, throat, and chest; chin, gorge, and edge of brown pectoral region blackish; upper tail-coverts, tail, under surface, under wing- and under tail-coverts, the tips of the secondary coverts and base of secondaries, with the outer webs of some of the underlying tertials, white; quills and a subterminal band on all but the two outer rectrices black, preceded on the central pair by a smoky wash. In examples not fully adult the black caudal band extends to the penultimate.

Young. Birds of the year have the head dark brown, edged fulvous; the white nuchal border as in the adult; neck, back, and wing-coverts olive-brown, palest on the fore neck, each feather edged with fulvous; quills as in the adult; forehead and chin whitish, the caudal band extending to the penultimate, and the outer web of the lateral rectrix smoky grey. In the second year the chin is blackish, and the head becomes black, specimens being commonly procured with the head-feathers mingled brown and black.

Obs. Ceylonese birds appear to average smaller than those from the mainland. I find that in a large series examined in Mr. Harting's collection, and in the Indian and British Museums, the wing varies from 7·6 to 8·0 inches, and the tarsus from 2·3 to 2·6, the smallest specimens being from Southern India, and the largest from the Calcutta district and Darjiling.

The Spur-winged Plover (*Hoplopterus ventralis*, Cuv.), which inhabits India as far south as the Godaveri, though not likely to occur in Ceylon, is worthy of notice. It is a larger bird than the present, with very sharp long black spurs at the shoulder at all seasons; the head is furnished with a long crest, and both are black, as well as a broad band down the throat and a large patch on the abdomen; the lesser wing-coverts at the point of the wing are also black, forming a band adjacent to the white greater coverts and secondaries; wings and terminal half of tail black; chest ashy grey, beneath with the basal part of the tail and under wing white. Wing of a specimen before me 7·9; tarsus 2·7; bill at front 1·15.

Distribution.—This handsome Plover is partial to the dry districts of Ceylon. It is, I imagine, more numerous in the north-west, from Jaffna down to Aripu, than anywhere else in the island; and Mr. Holdsworth

speaks of large flocks frequenting that neighbourhood in winter. Though I have met with it on the north and along the north-west coast, I never observed it at Trincomalie, nor anywhere in that district, and between there and Batticaloa it was rarely seen by me. Southward of this place it occurs not unfrequently; and between Hambantota and Yāla it is common and resident throughout the year, though it is there only an occupant of the maritime region, being replaced in the interior by the last species. In the Galle district it is, as far as my experience proves, entirely wanting. I understand that it has occurred in the Colombo district, but only as a straggler in the N.E. monsoon; I have not myself seen it south of Chilaw, where, as also further north, about Puttalam, it is not uncommon. At the latter place Mr. Parker has observed it, and has met with it far inland, halfway between Nikawaretiya and Anaradhapura. As a rule I do not think it strays much into the interior; but I have seen a young specimen at Mr. Whyte's which, I was given to understand, was shot in Dumbara.

In India it is found throughout the greater part of the country, but is confined, according to Mr. Hume, chiefly to the dry uplands. Mr. Bourdillon records it from the Travancore hills; but at what elevation he does not mention. I conclude that it inhabits the Carnatic in suitable localities, for Mr. Morgan found it breeding in that part; and as it inhabits the island of Ramisserum, is probably found in the Tuticorin district. In the Deccan it is common, according to Messrs. Davidson and Wenden, and is spoken of by Col. Sykes as affecting dry stony places in that region. In Chota Nagpur it is, says Mr. Ball, rare compared to the last species; but nevertheless pretty generally distributed; he records it from the Rajmehal hills, Birbhum, Manbhum, Lahardugga, Sambalpur, Orissa, Raipur, and the Godaveri valley. It is pretty common in some seasons at Calcutta, but appears to be absent in some years altogether. Mr. Hume, for instance, does not seem to have noticed it at all in the bazaars there, whilst Blyth says that it is not uncommon at times. Further east than this district it probably does not extend, as I find no record of it in 'Stray Feathers;' but there is a specimen in the British Museum from Darjiling. It inhabits the North-west Provinces, and breeds in Oudh. Towards the west it is not by any means numerous. Captain Butler says that it is not very common in the plains of Guzerat, and does not ascend to the hills. Throughout the surrounding districts of Cutch and Kattiawar it occurs; but is very rare in Jodhpore, and has only been once found in Sindh, on which occasion Major Le Messurier met with it near Kurrachee. In the northern portion of the province, writes Mr. Hume, it is unknown. It does not occur in Guzerat in the hot weather.

Habits.—The Yellow-wattled Lapwing, as I have already indicated, is an inhabitant of dry places, and quite avoids the moist damp lands, fields, and marshes which are the chosen grounds of the last species. I have always met with it in perfectly parched-up spots, such as are to be found lying between or around the leways and salt lagoons of the south-east of the island. Here, on the gently sloping land between the edge of the dense thorny scrubs, or on the dried-up soil, covered in the wet season by the waters of the lagoons, but then thoroughly baked and powdery in consistency, these birds were to be found in pairs or three or four together in scattered company. They are wary in their disposition, not permitting so near an approach as the last species; and I have found on emerging from the thorny fastnesses surrounding these great haunts of Waders that they would be on the wing (if anywhere near) before a hasty glance could be taken of what species were within shot, or else they were to be seen at a distance standing motionless and intently surveying the intruder who had so unexpectedly appeared on the lonely scene. In such solitudes, however, birds are often shier than they are in more frequented localities. The present species appears to be perfectly at home in these hot and arid wastes; and were it not that in tropical climates insect-life abounds everywhere, it would be difficult to realize that such spots could constitute feeding-grounds for the smallest of birds. The Aripu district, where Mr. Holdsworth met with this bird, consists of open plains, studded with low bushes and stunted groves of trees, and bears some resemblance to the Hambantota country. It subsists on ants, termites, small beetles, and other insects. Its flight is swifter and more regular than that of the Common Lapwing, and its note differs in being a shrill but somewhat plaintive cry of three syllables.

Nidification.—This bird breeds in the Hambantota district in June and July. A nest I found near one of the salt-pans not far from the town was situated near a pathway leading out of the jungle, and crossing an open grass-plot to the water, which was not far distant. It was a hollow excavated in the sandy ground and

devoid of lining, and contained four eggs, which were on the point of hatching; but the old bird was nowhere to be seen; on my returning the following day to identify the eggs, I found a Yellow-wattled Lapwing at the nest, and three eggs hatched off, but the young nowhere to be found, though I searched diligently for them. The eggs were pyriform in shape, of a stone-yellow ground-colour, blotched evenly all over with three shades of sepia, the darkest and richest markings being the largest; under these were small greyish-blue blotches. The egg which I took measured 1·46 inch in length by 1·12 in breadth. The old birds, which were both present, were very noisy, flying round and round like the last species, but not approaching so near to me. Layard describes the eggs as "rich nankeen, plentifully spotted with rather large blotches, some of which are dark brown, others grey, of a deeper or paler shade, and thickest at the obtuse end." The measurements he gives are 1·58 inch in length by 1·25 inch in breadth.

In India the Yellow-wattled Lapwing breeds in April and May throughout the plains and dry uplands. According to Mr. Hume the nests are usually in waste lands, known in Upper India as "*Osur maidans*," rarely in ploughed lands, never on sand banks or in the close vicinity of rivers or tanks. He observes, "on one or two occasions I have found the eggs overshadowed and more or less hidden by tufts of grass; but usually the nest is out in the open, without any attempt at concealment.

"The nest is a small circular depression scooped out by the bird, and entirely unlined, some 3 to 4 inches in diameter and an inch in depth, and often with a little earth, or a number of tiny pieces of kunker, scraped up against the margin all around, so as to deepen the cup. The eggs are always four in number." They are described as "buffy or pale greenish or olive stone-colour, pretty thickly studded with spots, streaks, and moderately-sized blotches of deep brown, interspersed with spots and streaks of pale olive-brown and dingy inky purple." Average size of twenty-two eggs 1·45 by 1·07 inch nearly.

GRALLÆ.

Fam. ŒDICNEMIDÆ *.

Bill in one group stout and large, in the other smaller and somewhat slender. Wing long, with a blunt tubercle at the point. Tail short, of 12 feathers. Legs long, the tarsus with similar scales before and behind; hind toe wanting; toes webbed at the base. Eye large.

Sternum with a single deep emargination. Stomach membranous. With no change of plumage in the breeding-season.

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* The members of this family might perhaps, with greater propriety, be included among the Otidæ as a subfamily; but as the true Bustards are wanting in Ceylon, I prefer to keep the Thicknees and Coursers separate by themselves.

Subfam. ŒDICNEMINÆ.

Bill stout, straight, the gape angulated, the gonys much pronounced. Legs long and rather stout, with the knee-joints enlarged and the tarsus reticulated before and behind; toes webbed at the base.

Of large size, with the head and eye very large, and of nocturnal habits.

Genus ŒDICNEMUS.

Bill large, stout, wide at the base, moderately long, the tip curved from the nostril, which is placed in a depressed and capacious membrane; gape angulated, commissure curved below the nostril and then ascending to the tip; gonys short and strongly angulated. Wings long, 2nd quill the longest. Tail graduated and cuneate at tip. Knee-joints enlarged. Tarsus more than twice the length of the middle toe, and covered with polygonal scutes; toes stout and webbed at the base. Head and eye large.

ŒDICNEMUS SCOLOPAX.

(THE STONE-PLOVER.)

Charadrius œdicnemus, Linn. Syst. Nat. i. p. 255 (1766).

Charadrius scolopax, S. G. Gmel. Reise, iii. p. 87, pl. 16 (1774).

Œdicnemus crepitans (Linn.), Temm. Man. d'Orn. ii. p. 521 (1820); Gould, B. of Eur. iv. p. 535 (1832); Sykes, P. Z. S. 1872, p. 166; Jerdon, Madr. Journ. 1840, xii. p. 215; Blyth, Cat. B. Mus. A. S. B. p. 260 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 108; Jerdon, B. of Ind. iii. p. 654 (1864); Holdsw. P. Z. S. 1872, p. 472; Von Heuglin, Orn. N.Ost-Afr. ii. p. 985 (1873); Hume, Str. Feath. 1873, p. 232, et 1875, p. 182; Legge, Ibis, 1875, p. 401; Butler & Hume, Str. Feath. 1876, p. 14; Armstrong, *t. c.* p. 340.

Œdicnemus indicus, Salvadori, Atti della Soc. Ital. Scien. Milano, viii. p. 370 (1866); Hume, Nests and Eggs, iii. p. 581 (1876); Ball, Str. Feath. 1878, vii. p. 227.

Œdicnemus scolopax (S. G. Gm.), Dresser, B. of Eur. pt. 55, 56 (1876); Hume, Str. Feath. 1878 (B. of Tenass.), p. 458, et 1879, viii. (List of Ind. B.), p. 112.

Grand Pluvier ou *Courlis de terre*, Buffon; *Le Grand Pluvier*, Buffon, Pl. Enl. 919; *The Great-headed Thicknee*, *The Norfolk Plover*, *Stone-Curlew*, *The Thicknee*, popularly in England; *Bastard Florikin* in India; *Alcaravan*, Spanish (Saunders). *Karwanak*, also *Barsiri*, Hind.; *Lambi* of Falconers; *Kharma*, Bengal.; *Kalleydu*, Telugu; *Kana mosal*, Tamil, lit. "Jungle-Hare" (Jerdon); the same in Ceylon.

Adult male and female (Ceylon). Length 15·75 to 16·5 inches; wing 8·25 to 8·6; tail 4·5; tarsus 3·1 to 3·2; middle toe and claw 1·5; bare tibia 2·0; bill to gape 2·05, at front 1·0.

Iris yellow, mottled and pencilled with dark brown; bill black, greenish yellow from base to end of nostril-membrane

and beneath as far as the chin; legs and feet pale greenish yellow, bluish on the joints and toes. Some individuals have the culmen black up to the forehead, or nearly so, and it remains to be shown whether this is a sign of age or the reverse.

Head, upper surface, greater wing-coverts, tertials, and central rectrices ashy brown, palest on the hind neck, tail, and rump, and darkest on the head and scapulars; the centres of the feathers blackish brown, and the margins rufescent; coverts above the ulna blackish brown, with brighter rufous margins than elsewhere, the next row barred across the centre with white, and the greater coverts with deep terminal margins of white, forming two bars across the wing, between which is a blackish band; quills and tail brownish black; a bar across both webs of the 1st and 2nd primaries and the inner web of the 3rd, another extending from the 9th to the inner web of the 6th, as also the tips of the 7th and 8th, and a subterminal band across the tail white; basal portion of tail-feathers crossed with light bars; lores, superciliary stripe, cheeks, chin, throat, and under surface white; a stripe beneath the eye from the anterior corner, another from lower mandible to the ears, and the centres of the feathers on each side of the middle of the fore neck, as also on the chest, blackish brown; under tail-coverts pale rufous.

Young in down (Norfolk, coll. Harting). Above greyish buff, the down short and tipped with brown; two narrow well-defined black stripes pass up the back from the rump to the neck and meet on the crown; a narrow stripe runs from the eye and joins those on the nape, and one from the centre of the forehead passes over each eye; a black stripe from the tail along the side of the rump to the wings, and one on the wings; beneath buffy white, tinged with greyish on fore neck.

Obs. A small series from India which I have examined do not differ materially from Ceylonese birds: the central stripes of the upper-surface feathers vary in width, and the bill is subject to considerable variation in size. Indian specimens in the British Museum and Mr. Harting's collection measure:—Wing 8·4 to 9·7 inches; tarsus 3·0 to 3·4; bill at front 1·6. Mr. Hume remarks that Indian examples average smaller than European, and on this account the race was separated by Salvadori as *Œ. indicus*; but dimensions vary, as Sindh birds are larger than Upper Indian ones. A fine example of the pale or desert form which this species assumes in arid climates, lately sent to England from the Attrek river, has the upper plumage yellowish sandy brown, and the central tail-feathers are sandy mottled with brown; wing 9·0 inches, tarsus 3·0, bill at front 1·4. Two Egyptian examples measure, wing 9·4 to 9·6 inches, tarsus 2·8, bill at front 1·7, and two killed in England, wing 9·4 inches; so that Indian specimens attain to quite the size of European and Asiatic. Autumn birds after moulting have the marginal portions of the back-, scapular, and wing-covert feathers a brighter rufescent than they are some months afterwards, when they have become, through time and exposure, of a greyish hue and are often much abraded. *Œ. senegalensis*, Swains., is a closely allied species, somewhat smaller (wing 8·6 to 9·0 inches), and has no upper white wing-bar, the lesser and median coverts being brownish grey with black central stripes; the upper-surface feathers are grey-brown, with narrower central black feathers than in *Œ. scolopax*. There are several other species of this fine genus, one of which, *Œ. maculosus*, Cuv., from South Africa, is very handsomely marked; another, *Œ. grallarius*, Lath., from Australia, is remarkable for its large size and lengthened tail, and has been separated as *Burhinus*, Illiger. An example in Mr. Harting's collection measures—wing 11·75 inches, tail 6·5, tarsus 4·8. The under surface is whitish, and the chest and breast marked with bold stripes of black.

Distribution.—The "Thicknee," though widely distributed in Ceylon, is by no means a very common or a plentiful species. Layard considered it to be "much more frequent" than the last; but my experience has been the reverse. I conclude, therefore, that it is tolerably abundant in the Jaffna peninsula, in a portion of which, the Pt. Pedro district, he resided, and near which I have seen it in jungly wastes at Ethelumaduvil, not far from the Elephant Pass. Mr. Holdsworth speaks of it as common at Aripu at all seasons. In the Trincomalie district it was found in pairs, or two or three together in certain places, and I always noticed it more during the latter end of the year than in the hot weather, when it probably retired to secluded spots to breed. Near Batticaloa it is to be found in the sandy scrubs; and in the islands in the Lake I have met with it in August, when it appeared to be breeding. In the Hambantota district it is resident, but on the west coast I have only noticed it during the north-east monsoon. It is then to be found as a straggler in the Morotuwa, Colombo, and Negombo cinnamon-gardens, which places appear to be its only resort in that part of the island. Mr. Parker has met with it at Puttalam; and it is probably resident there, as no doubt also at Chilaw. It is evidently a dry-climate species, mostly avoiding damp districts, and in Ceylon confining itself to the sea-board.

Jerdon remarks that this Stone-Plover is found in most parts of India down to the extreme south, and says that it is more rare in Malabar and Lower Bengal than in other districts. Mr. W. Morgan writes, in 'The Ibis,' 1875, that he found it breeding near Kurnool in May. In the Deccan it is not uncommon, according to Messrs. Davidson and Wenden; and the Rev. Dr. Fairbank records it from the Khandala district. In Chota Nagpur it is rare, but met with sometimes in jungle, the districts in which Mr. Ball observed it being enumerated as the Rajmehal hills, Manbhum, Lohardugga, Singhbhum, Sirguja, Sambalpur, Orissa, and the Godaveri valley; and from Raipur Mr. Hume has received it. About Calcutta it is rare, and from Furreedpore it is not recorded at all. Towards Burmah it is scarce. Captain Feilden procured a single specimen near Thayetmyo. Mr. Blanford met with a considerable flock on the Irrawaddy in September; and on the delta of the same river Dr. Armstrong observed it rarely. In Tenasserim it is confined to the plains country of the central portions of the province, and is rare there. It is found in pairs or solitary, and was met with by Mr. Davison on Thatone plains and on the banks of the Attaran near Moulmein. This district appears to be the limit of its range in South-east Asia; and it has not been observed in China, or anywhere to the eastward of Burmah. In Upper India it is, I imagine, not uncommon, and extends in equal numbers through suitable places in Rajpootana to Sindh. In the Sambhur-Lake district Mr. Adam met with it in the hills near Nawa at Maha Pahar. It is not uncommon in Sindh, and also in Kattiawar, Guzerat, and Jodhpoor, wherever there is low scrub-jungle on sandy plains. Severtzoff remarks that it breeds in Turkestan in the south-east and throughout the north up to an altitude of 4000 feet; but in the more elevated region of Kashghar Dr. Scully did not meet with it. I have seen it from the Attrek river, on the eastern shores of the Caspian, and it is doubtless distributed throughout this region, much of which is suited to its habits. In Palestine, Canon Tristram met with it on the plains near Jericho and on the sand-dunes near Beersheba. In Asia Minor it is not uncommon in barren country. Mr. Danford obtained it in woods at Anascha, and got its eggs at Boghaslü Khan in May. In Turkey it is considered by Messrs. Elwes and Buckley to be a summer visitor, as the climate is too cold for it in winter. It is abundant in Southern Russia, breeding in numbers near Odessa, and is not uncommon in Greece; whilst in the islands of Sicily, Malta, and Sardinia it is more or less resident. In parts of Italy it is likewise resident, as also in Spain, in the south of which country it is common, and affects barren plains and dry watercourses. Near Gibraltar it is, writes Col. Irby, resident in considerable numbers; Lord Lilford has seen it at Madrid, and Mr. Saunders at Malaga. It is very rare in Transylvania, having occurred at Alvincz, on the Maros river, and in the Hátzeg valley. As regards Central Europe, it is not uncommon in some parts of Germany and rare in others, and is said not to have been noticed in Upper Silesia, though it breeds in other parts of the province. Its northerly limit is Denmark, as it has not been recorded from Scandinavia or Northern Russia. It is a summer visitant to England; and has been known to breed, according to Mr. Moore, in the counties of Dorset, Hants, Sussex, Kent, Herts, Oxford, Bucks, Suffolk, Norfolk, Cambridge, Worcester, Lincoln, Rutland, Nottingham, and Yorkshire; but it is rapidly decreasing in these localities. In France, writes Mr. Dresser, it is more abundant in the south than in the north, being principally found on passage in the latter. In Holland and Belgium it is likewise a bird of passage. Passing over Spain to the continent of Africa we find Col. Irby recording it as common in Morocco near the Straits. Mr. Gurney met with it at Laghouat in Algeria, and it has been observed on the borders of the Sahara desert. Throughout Egypt and Nubia, writes Captain Shelley, it is found in pairs and families where there are desert places in the neighbourhood of small bushes. In the same regions Von Heuglin met with it, and also in Kordofan and Abyssinia, from which latter country Mr. Blanford records it too; in the Somauli country Von Heuglin believes he saw it. How far south it is resident he cannot say; but he found it sedentary in the Assouan district, and along the shores of the Red Sea he observed it now and then. In the Somauli country its place is taken by *Œ. affinis*, Rüpp., a near ally of the Cape species, *Œ. capensis*, Licht. The present bird is doubtfully recorded by Von Heuglin from West Africa; but in all the Canary Islands it is found, and near Port Orotava, in Teneriffe, Godman met with it in abundance. It is said by Mr. Vernon Harcourt to be a straggler to Madeira.

Habits.—This well-known bird confines itself, in Ceylon, to sandy places which are dotted pretty thickly with shrubs, or to dry marsh-land where there are clumps of bushes either scattered here and there, or lining the borders of creeks intersecting it. In such a locality near the so-called Salt Lake at Trincomalie two or

three birds were generally to be found; but so watchful were they, that on hearing one's footsteps a long way off or seeing the approach of any one from a distance they would take to their heels, and dodging adroitly round the bushes would squat down in some sequestered nook where it was almost impossible to find them. When they are surprised they run swiftly for a yard or two and then get up, flying over the bushes and suddenly dropping, when they will run with all speed, and cannot again be flushed without a dog; or they will squat on the ground resting on their tarsi, and so endeavour to avoid observation. From this habit they are called by the natives "Jungle-Hare." Indeed the habits of both this and the next species are not those of Plovers, but resemble more those of the Bustards, to which family they are allied as regards their anatomy. It is very fond of the cinnamon-gardens on the west coast, as these bushy places are exactly suited to its tastes; and I have seen it even in the cultivated cinnamon at the back of the bungalows of Colpetty. In India it is often found among stony low hills, or in cleared spots in the jungle; and it is, according to Jerdon, a favourite quarry for the *Shikra* with the natives. It is nocturnal as regards feeding, and subsists on grasshoppers, Mantidæ, flies, bugs (*Hemiptera*), and so forth. It has been noticed to run quickly to and fro among grass, snapping off the insects from the blades as it proceeded. It has a wild loud cry, not so musical or so high in tone as that of the next species, nor does it consist of so many syllables. I have never heard it in the daytime, except on one occasion, when I met with a pair which evidently had a nest in an island on the Batticaloa Lake, and which were very noisy, uttering loud cries even before I landed in their domain.

In Egypt the "Stone-Curlew" contracts, according to Von Heuglin, rather abnormal habits. He notes that, elsewhere so shy, it has there, to some degree, taken up with human beings, and runs about, often in considerable numbers, on the flat roofs of mosques, manufactories, barracks, fortifications, tombs, and dilapidated houses, even breeding among them, and that it is also to be seen among ruins, graveyards, and rubbish-heaps. This is a noteworthy instance of the manner in which local circumstances often affect the habits of a species. A more unlikely place to find this skulking Plover than the roof of a mosque can scarcely be imagined.

The flesh of this bird is excellent eating. The young, according to some observers, appear to be helpless and unable to run until quite fledged; but this apparent incapability must be merely the result of an inherent habit of crouching to escape observation. Captain Marshall mentions finding a young bird, which was nearly fledged and able to walk about, squatting on the nest, allowing him to catch it without moving. In White's 'History of Selborne' we read that the young run immediately from the eggs, and are "withdrawn to some flinty field by the dam, where they skulk among the stones, which are their best security; for their feathers are so exactly of the colour of our grey spotted flints that the most exact observer, unless he catches the eye of the young bird, may be eluded."

Nidification.—The breeding-time of this species in Ceylon is, I think, the months of July and August on the east coast; but I did not succeed in finding their eggs when I met with the pair above spoken of. In India the majority, says Mr. Hume, lay in April, but eggs may be found from February till August. Concerning its nidification he writes as follows:—"According to my experience in Upper India, the place of all others in which they love to breed is some huge old mango-tope in which the trees are not very thick, surrounded by a good high mud bank, and of which the grass is strictly preserved by some native gentleman for the use of his cattle towards the close of the hot weather, when all other grass has disappeared. In such a grove I found thirteen nests, and saw at least fifty birds, many of which had not apparently yet lain. The nest is a mere hollow scooped out by the birds, very often in the midst of a layer of dead leaves, generally quite unlined, occasionally with a few blades of grass doing duty as lining. If the nest is out in an open place it is generally more or less concealed at the base of some bush or tuft of grass; but if in a grove it is generally not far from some large root of one of the mango-trees in the midst of dead leaves, and these so harmonize with the colour of the eggs that no further concealment is necessary. A dozen times I have passed over, all but treading on eggs thus placed, and which I was eagerly looking for. Two is the ordinary number of eggs laid, but I have found three in a nest half a dozen times. I should guess that in about one in ten nests three eggs occur."

The eggs of the "Thicknee" are very large for the size of the bird. Some are almost perfect ovals in shape, while others are longer and more pointed at the small end. They are yellowish stone-colour, some with a grey hue and others with a brown. The markings are streaky or irregular angular blotches and clouds

of olive-brown mixed up with lighter streaks and strokes of a brownish straw-colour overlying smaller marks of bluish grey. In some the markings are much more linear than in others, and are collected round the centre of the egg. Some examples in the series before me measure 1·96 by 1·48 inch; 2·23 by 1·47; 2·04 by 1·48.

Mr. Hume, writing of an Indian series, says that they are smaller than English specimens; he finds the ground-colour invariably yellowish white, buffy yellow, or pale buffy brown. One egg is greenish white, with only a few brown specks on it; another is stone-colour, with enormous map-like blotches or clouds on the "broad half." In length they vary from 1·65 to 2·15 inches, and in breadth from 1·3 to 1·5 inch.

Genus ESACUS.

Bill stout and long, suddenly widened at the base; culmen straight as far as a point exactly above the gonys, where it is gently recurved to the tip; gonys deeply angulated and ascending; gape angulated; commissure straight from the gape-angle and then recurved. Nostrils linear, wide, and placed in a capacious depression. Wings long, pointed; the 2nd quill the longest, and the 3rd longer than the 1st; tertials exceeding the primaries. Tail rather short, of 12 feathers, round at the tip. Legs long; tibia bare much above the knee, which is enlarged. Tarsus nearly twice as long as the middle toe, reticulate in front and behind; toes stout, the basal membrane well developed; hind toe wanting.

Head and eye large.

ESACUS RECURVIROSTRIS.

(THE GREAT STONE-PLOVER.)

Œdicnemus recurvirostris, Cuv. Règ. An. i. p. 500, note (1829); Jerdon, Madr. Journ. 1840, xii. p. 215.

Carvanica grisea, Hodgson, J. A. S. B. 1836, v. p. 776.

Esacus recurvirostris (Cuv.), Blyth, Cat. B. Mus. A. S. B. p. 260 (1849); Kelaart, Prodromus, Cat. p. 132 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 108; Jerdon, B. of Ind. iii. p. 652 (1864); Beavan, Ibis, 1868, p. 391; Holdsworth, P. Z. S. 1872, p. 472; Hume, Str. Feath. 1873, p. 232; id. Nests and Eggs, iii. p. 579 (1875); id. Str. Feath. 1875, p. 182; Ball, *t. c.* p. 294; Legge, Ibis, 1875, p. 401; Butler & Hume, Str. Feath. 1876, p. 14; Hume & Davison, ibid. 1878 (B. of Tenass.), p. 458; Davidson & Wenden, ibid. 1878, vii. p. 88; Ball, *t. c.* p. 227; Cripps, *t. c.* p. 301; Hume, ibid. 1879, viii. p. 112 (List Ind. B.).

Curved-billed Bustard; *Bastard Florikin*; *Curved-billed Plover* of some. *Burra Karwanak*, Hind.; *Abi*, of Hindoo Falconers; *Gang titai*, lit. "Ganges Lapwing," Bengal. (Jerdon); *Mosul-Krandi*, *Mosul-Kanati*, lit. "Hare-eyed" (Layard).

Adult male (Ceylon). Length 20·0 inches; wing 10·5 to 10·7; tail 4·75; tarsus 3·2; middle toe and claw 2·0; bill to gape 3·4 to 3·5.

Female (Ceylon). Length 21·5 inches; wing 10·7 to 10·9; tarsus 3·5; middle toe and claw 2·3; bill to gape 3·6 to 3·7.

Iris pale golden, marked with brown radii or pencillings; eyelid and orbitar skin yellowish; bill black, with the base of upper mandible to the nostril, and that of lower to the gonys, yellow; legs and feet pale yellowish green, the toes washed with brown, and the soles and posterior part of knees bluish.

Head, hind neck, back, scapulars and rump, basal portion of tail, as also the coverts along the ulna, pale cinereous brown, the feathers on the upper parts with dark shafts, and the head and nape darker than the rest; forehead and along past the gape, lower part of cheeks, throat, a circle round the eye, continued as a broad streak down to the nape, and under surface white: the throat washed with pale cinereous grey, and the feathers there with darkish shafts; a streak beneath the gape and a border round the white orbital region, expanding over the ear-coverts and blending into the brown of the neck, black; primaries, secondaries, a band formed by the tips of the lesser coverts, and the terminal portion of tail brownish black; basal part of inner edge of quills, a bar across the first three primaries (on the outer web of the 1st only), the three inner primaries (with the exception of the centre part), and a band across the tail white; beneath the brown wing-band a line of white formed by the bases of the next row of feathers.

Immature birds have the feathers of the upper part of the back, the scapulars, and the lesser wing-coverts tipped with greyish; and those of the dark wing-band edged with fulvous-brown.

Obs. Indian examples which I have examined do not differ from Ceylonese. A specimen from Bhotan is identical with one of my own—wing 10·7 inches. Dimensions of Indian birds, as recorded in 'Stray Feathers,' are:— ♂ (Sindh), length 21·0 inches, wing 10·5, expanse 36·5, tail 5·5, tarsus 3·4, bill at front 3·0, weight 1 lb. 12 oz. (*Hume*); ♂ (Furreedpore), length 20·0, wing 10·25, tail 4·5, tarsus 3·42, bill from gape 3·42 (*Cripps*).

Esacus magnirostris, Geoffr., is the Austro-Malayan representative of the present bird, and has recently been found in the Andaman Islands. It is a larger, darker, and more massive-billed form of the Indian bird. In plumage it differs in having the head and face much darker; the sides of the crown and nape, cheeks, and ear-coverts blackish brown, and the top of the head deeper brown than in the present bird; the winglet and the lesser wing-coverts are dark brown, and the white wing-bar succeeds the latter part; the upper part of the throat is white and the lower dusky, with the feathers striated. An Australian specimen in the national collection measures 2·7 inches

in the bill at front, which is less than in some specimens of the smaller Indian bird; but the bill is very stout and broad, measuring 0·75 inch in height at the base; wing 10·6. The dimensions of an Andaman example (male) are given by Mr. Hume as follows:—length 22·5 inches; wing 11·0; tarsus 3·5; bill at front 3·1.

Distribution.—This large Plover is a locally distributed bird in Ceylon, occurring all round the coast from Chilaw and Puttalam northwards to Jaffna, and thence down the east coast to Trincomalie. Along this line of sea-board it may be found here and there as isolated individuals or two or three together; but it is nowhere numerous. I have seen it on Karativoe Island, at Aripu, Manaar, on the Erinativoe Islands, and in many places on the Jaffna peninsula, including the vicinity of Elephant Pass. About Trincomalie it is a resident species, and extends inland to Kandelay tank. At other large sheets of water I have not seen it; and in Ceylon it is not diffused along the river-beds, as in India, but is almost entirely a littoral species. Southward of Trincomalie I have seen it near tanks down to the Virgel, and also met with it between that river and Batticaloa. It probably occurs in the neighbourhood of this latter place, and thence down the coast to Yāla, between which and Hambantota it is not uncommon. I have seen it there in March and in July, so that it must be resident there as in the north. On the south-west I have never known it to occur. Layard was under the impression that it was migratory, and states that he has seen it coming from the seaward in the month of December. It is probable, therefore, that there may be a partial migration from the coast of India at that time; but as it breeds freely in the island, it is unquestionably, to a great extent, resident in it. Mr. Holdsworth has seen it in August at Aripu, and I have observed it all through the year at Trincomalie, although during the breeding-season it used to leave its wonted haunts about the harbour, and retire to secluded sand hills and waste places to breed.

In India it is apparently distributed here and there throughout the country, occurring only as a straggler beyond Burmah; and it seems to be more abundant in Central India along the valley of the Ganges, say between the division of Chota Nagpur and the Delhi district, than elsewhere. In the Deccan it is said to be "not uncommon" (*Davidson*). In Chota Nagpur Mr. Ball records it from the Koel river and the rocky beds of the Mahanadi and Ebe, in the Sambalpur district, and says it is particularly common on the Brahmini river in Orissa; he likewise records it from the Godaveri valley. About Calcutta it is rare, not more than a dozen specimens on the average being seen in the market in one season. Further east in Furreedpore it is rare, according to Mr. Cripps. How far to the north in this direction it extends I do not know; but there is a specimen from Bhotan in the British Museum. On the Burmah rivers Blyth stated it to be common (Ibis, 1867, p. 165); but I find but little record of its occurrence in that country of late years. Captain Feilden procured it on the Irrawaddy at Thayetmyo; but Dr. Armstrong did not meet with it on the Delta. It is rare in Tenasserim, where Mr. Davison met with it on the Houngthraw and Attaran rivers, and observes that it is only occasionally seen there in pairs or in small parties. In the Andamans it is replaced by the Australian species. It is found along the sandy beds of rivers in the North-west Provinces, and extends into the Punjab, where Mr. Hume says that it is found on all the great rivers, as also in Sindh on the Indus. Captain Butler writes that in Northern Guzerat it is rare; he procured a pair on a gravelly island in the bed of a river between Ahmedabad and Deesa, and met with it once or twice elsewhere. It is also found, but rarely, in Kattiawar, Cutch, and Jodhpore. It is doubtful, observes Captain Butler, whether it is migratory or not to Guzerat. Hodgson was under the impression that this bird migrated to Thibet in winter; but I find no recent record of its occurrence beyond the Himalayas; and the specimens he procured in Nepal were in all probability following up the beds of the rivers for the purpose of breeding.

Habits.—Both this and the last genus differ from true members of the great Plover family in their nocturnal habits, for which their large eyes, which form such a marked characteristic, are eminently adapted. In Ceylon, where the majority of the rivers, whose beds are half-dry during a great portion of the year, chiefly flow through thick jungle, the Great Stone-Plover finds no congenial home on their banks; and it consequently differs in its habits from its fellows in India by frequenting the sea-shore, rocky islets in harbours, the sandy, gravelly borders of tanks, or backwaters near the sea, and such like. They are very local, taking up their quarters in one spot, particularly a rocky or shingly islet, for many months at a time; and so quiet are they in the day-time that, though their quarters may be close to a public resort, they are scarcely ever seen or heard until

sundown, when they sally off to feed, uttering their singular musical whistle as they fly about in the fast-fading twilight. A pair frequented the little island close to the entrance to the Trincomalie fort, and in the evening gave signs of their presence by flying over the esplanade backwards and forwards to the sands in Back Bay, frequently whistling as they crossed and recrossed the ground. On moonlight nights they were to be heard all night long, as they wandered here and there, startling the stillness of the night with their *kreee, kreee—kree̅, krĕkrĕkrĕkrĕ,* the first syllables being long drawn and the last gradually increasing in speed until the note ceased. They are wary birds both by day and night, but they will allow a boat to approach quite close sometimes before taking flight. They fly in a straight and even course, taking short quick strokes of the pinions. They subsist on crabs and mollusca, as well as insects, and feed almost entirely at night, for I have shot examples in the afternoon with their stomachs perfectly empty. An individual which was winged from my canoe off Gunpowder Island, Trincomalie, when I commenced to pursue it took to the water, swimming well, and when approached uttered loud craking cries of alarm, and dived freely, making its way along beneath the surface with ease.

In India, as above remarked, they confine themselves to the beds of rivers, especially, writes Mr. Hume, those in which rocky or stony banks or islands crop up.

Nidification.—This species, I am informed by Mr. G. Simpson, of the Indian Telegraph Department, breeds in the island of Manaar in February. In the following month I found it nesting in the Jaffna peninsula near Pootoor and at Aripu. I was unable to find its eggs at either place, and imagine, from the anxious manner in which the birds flew round me, uttering their piping whistle, that they had young. A pair of eggs were sent to me in March 1877, just before leaving the island, which were taken in the shingly island in the Kanthelai tank. They were found, I believe, in a depression in the sand and gravel not far from the water's edge. One is oval in shape, and the other a rather broad, somewhat pointed oval. The ground-colour is greenish drab: one is openly clouded with longitudinal patches of several shades of blackish sepia, overlying inky-grey smears and blotches, some of the dark markings being of a linear shape; the other, which is slightly paler in colour, is rather closely marked with longitudinal washed-out blotches of the same colour, intermingled with streaky scribblings, spottings, and irregular tracings of the same hue, all of which are pretty evenly distributed over the entire surface of the egg. They measure 2·25 by 1·7 and 2·19 by 1·71 inch.

In India the Curved-billed Plover breeds in river-beds where there are banks of sand and shingle or "outcrops of rocks mingled with patches of sand." Captain Marshall, however, once found the nest in a ploughed field in the Sharunpoor district, three quarters of a mile from the nearest water. The nesting-season lasts from March until June. On the Jumna, where Mr. Hume took many eggs, they were deposited in shallow depressions in the sand in places surrounded by rocks, and sometimes beneath edges of the same. The eggs, which are two in number, vary, he remarks, from a pale cream-colour, through an earthy drab-colour, to a somewhat pale olive-brown, the markings consisting of "all possible combinations of blotches, streaks, lines, &c. (in some cases thickly sown over the whole egg, in others sparsely distributed) of every shade of olive and umber-brown, in some becoming almost black." The average of twenty eggs is said to be 2·15 by 1·6 inch, the largest measuring 2·32 by 1·7. Mr. Anderson has known a wounded bird remove the eggs she had been sitting on before being fired at.

GRALLÆ.

ŒDICNEMIDÆ.

Subfam. CURSORINÆ *.

Bill somewhat slender and curved or straight. Legs slender; knees slightly enlarged. Tarsi shielded with stout transverse scutes before and behind. Toes short and slightly webbed.

Stomach large and membranous.

Genus CURSORIUS.

Bill wide at the base, curved throughout, the tip bent; nostrils oval and basal, placed in a depression. Wings moderate, the 2nd quill equal to or slightly longer than the 1st; tertials nearly as long as the primaries. Tail short and rounded. Tarsus and bare tibia covered with transverse scutes before and behind; knees thick; toes very short, the middle toe much longer than the lateral ones, united to the outer at the base by a web, and also to the inner by a very small one; claws short and straight, the middle one pectinated.

CURSORIUS COROMANDELICUS.

(THE INDIAN COURIER.)

Charadrius coromandelicus, Gmel. Syst. Nat. i. p. 692 (1788).

Cursorius asiaticus, Lath. Ind. Orn. ii. p. 751 (1790).

Cursorius coromandelicus (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 259 (1849); Kelaart, Prodromus, Cat. p. 132 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 108; Jerdon, B. of Ind. iii. p. 626 (1864); Beavan, Ibis, 1868, p. 388; Holdsw. P. Z. S. 1872, p. 470; Adam, Str. Feath. 1873, p. 393; Hume, *t. c.* p. 421; Ball, ibid. 1874, p. 429; Parker, ibid. 1875, p. 267; Hume, Nests and Eggs, iii. p. 564 (1875); Butler & Hume, Str. Feath. 1876, p. 10; Fairbank, *t. c.* p. 262; Davidson & Wenden, ibid. 1878, vii. p. 87; Ball, *t. c.* p. 226; Hume, ibid. 1879 (List B. of Ind.), p. 111.

Coure-vite de Coromandel, Buffon, Pl. Enl. 892; *Coromandel Plover*, Latham; *The Indian Courser*, *The Indian Courier-Plover*. *Nukri*, Hind.; *Yerra chitawa*, Telugu.

Adult male and female (Ceylon). Length 8·8 to 9·5 inches; wing 5·8 to 6·1; tail 2·3 to 2·5; tarsus 1·95 to 2·15; bare tibia 0·85 to 1·0; middle toe and claw 0·95 to 1·05; outer toe and claw 0·55; bill to gape 1·1 to 1·2. Females as observed by me average larger than males.

Iris dark brown; bill blackish; gape and base of lower mandible yellowish; legs and feet yellowish white or whitish, joints dark, claws black.

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* The Courier-Plovers resemble the Stone-Plovers in their anatomy, both showing affinity to the Bustards in this respect; in many of their habits the two groups are alike. The remarkable Double-banded Plover, *Rhinoptilus bitorquatus*, Jerd., is, in the matter of the bill, to a slight extent a link between *Cursorius* and *Œdicnemus*.

Forehead and crown rich deep rufous; the occiput jet-black, running to a point, and partly concealed by the overlying rufous feathers; a broad, velvety, white supercilium running back round the black occiput, and likewise ending in a point; a broad black band from the nostril through the eye bounding the white stripe all round; chin, face, and gorge white, passing into the pale fulvous rufous of the ear-coverts, neck, throat, and chest, the latter darkening on the centre of the breast into deep rufous; lower part of hind neck, back, rump, wing-coverts, tertials, most of the tail, sides of breast, flanks, and secondary under wing-coverts quaker-brown; primaries and their coverts above and beneath, a subterminal band on the tail, and the centre of the belly black; abdomen, under tail-coverts, sides of the rump, tips of upper tail-coverts, lateral tail-feathers, and tips of the remainder, decreasing towards the centre, white.

The black markings of the tail vary (probably the result of immaturity) in birds otherwise plumaged alike, some examples having the black bar present on the central feathers and the inner web of the laterals.

Females have the rufous of the head and black of the abdomen paler than males. I am unable to state whether this character is constant; but it is observable in two specimens I have examined from Ceylon.

Young. An immature bird from the Punjab measures 5·7 inches in the wing, and has the forehead paler, inclining to fulvous; the chest is likewise of a paler hue than in adults; the feathers extending from the shoulder along the bend of the wing to the point are dark brown, edged with rufescent buff; and some of the median coverts overlying the tertials have whitish marginal patches as well as tips; the subterminal patches of the tail-feathers are brown instead of black, and the under wing is blackish brown instead of black.

Obs. Indian specimens in the national collection correspond in the tints of their plumage with Ceylonese. A small series measure as follows:—wing 5·9 to 6·0 inches, tarsus 2·1 to 2·2.

Captain Beavan's measurements of four examples shot at Umballah and Morar are as follows:—Length 8·7 to 9·3 inches; wing 5·3 to 6·1; tail 2·25 to 2·37; tarsus 1·93 to 2·25; bill from gape 1·18 to 1·25.

The European representative of this handsome Courser is *C. gallicus*; it inhabits the southern parts of that continent, Northern Africa, and extends through Western Asia to Sindh and Rajpootana. It is called the Cream-coloured Courser, and is larger in the bill and stouter in the leg than our bird. The upper surface is a warm creamy fawn-colour, reddest on the tail, forehead, and crown; the nape is ashy, with an underlying black patch, under which a white stripe passes from above the eye, bounded beneath by a black band, which, however, does not pass through the eye; wings black, secondaries tipped with white; beneath delicate greyish fawn-colour, paling to white on the lower parts; under wing black. Wing of a Sambhur-Lake specimen before me 6·1 inches; tail 2·7; tarsus 2·0; bill to gape 1·4.

It is interesting to note that the South-African species, *C. burchelli*, Swains., is, in a manner, a representative of our bird, possessing the same type of coloration. The upper surface is rufous sandy brown, the front part of the head and the sides of the hind neck chestnut; but the occiput is *ashy grey*; the black nape and underlying white and black stripes are much as in our species; the breast is pallid rusty brown, set off against the white abdomen by a black border. It is a smaller bird than the Indian. A Natal specimen measures 5·2 inches in the wing.

The remarkable Double-banded Plover, *Rhinoptilus bitorquatus*, Jerd., belongs to this family, but has a stouter and straighter bill, and appears to be restricted to a very limited area near the Eastern Ghâts.

Distribution.—This interesting bird has a very limited range in Ceylon, being confined to the Jaffna peninsula and the north-west coast (including the island of Manaar) as far south as Pomp-Aripu. Beyond this place I do not think it extends, as the large tract of jungle between there and Puttalam seems to present a barrier to its further wanderings towards the south.

Layard speaks of finding it on the Wally plains in the month of April; and Mr. Holdsworth saw it in almost every month in the year about Aripu, though it was more numerous in the winter season than at other times. I did not meet with it on the Jaffna plains, but found it on open land along the west coast to the north of Mantotte, and also met with it in the island of Manaar; it was, however, more numerous about Aripu than anywhere else. Mr. Simpson, who resides in Manaar, has seen it on the coast-plains along the sea-board from there up to Pooneryn; but he tells me that it is never met with inland. I do not think that there is any migration from India to Ceylon during the cool season, but that the birds merely assemble together in favourable localities from the surrounding districts.

In India it would appear to inhabit the northern parts of the peninsula more than the southern; but it

does not seem to extend into the far north-west, where it is replaced by the Cream-coloured Courser. Captain Butler writes that it is common all over the plains of Guzerat in the cold weather, being apparently migratory, as it is not found there during the hot weather. It does not occur in the northern parts of Sindh, according to Mr. Hume, nor in the greater portion of Jodhpoor; but has been recorded from the east of Sindh by Messrs. James and Doig. It is rare in Cutch. About the Sambhur Lake it is, says Mr. Adam, very abundant in the cold season, and associates with *C. gallicus*. Captain Beavan procured it near Umballah in the month of November, and states that it is commoner a month later at Morar. Mr. Ball writes of it as "common on the plains of Sirguja," and as also frequenting the Main Pât, a plateau of about 3600 feet elevation; nor is it rare, he says, in Birbhum, to the north of Suri. He records it also in the same direction from Hazaribagh, also from Lohardugga, Bilaspur, Sambalpur, and Orissa, north of the Mahanadi; likewise from Raipur, Nowargarh, Karial, and the Godaveri valley. In the Deccan it is, according to Mr. Fairbank, common in the cold season, and also occurs in July, while Messrs. Davidson and Wenden say that it breeds there. I have no data as to its occurrence in the extreme south; but I conclude that it inhabits the plains and open country in the Carnatic, although Jerdon states that it is unknown on the Malabar coast.

Habits.—In Ceylon the Indian Courser frequents bare pasturage, sandy plains dotted with herbage and bushes, dried-up paddy-fields near the sea-shore, and so forth. In India it is to be found both in the interior and near the sea, frequenting, as Jerdon remarks, "the barest plains and ploughed fields." In its actions and deportment it resembles the Bustards, or still more the Collared Plain-Wanderer of Australia, *Pedionomus torquatus*, Gould. Associating in little troops, the members of which keep some little distance apart from one another, it runs hither and thither, taking a few not *very* rapid strides, suddenly stopping and advancing or retiring in a new direction; and when it checks itself in its progress it stretches up its head, which at all times is carried very erect, as if to take a better view of its position. It does not appear to see well with the horizontal rays of the sun in its eyes, as I found no difficulty in approaching it at sunrise under these conditions. When shot at while standing and mortally wounded, I noticed that it flew a little distance as if unhurt, and remained erect until it suddenly fell to the ground dead; others would squat on the soil when their companions were fired at, as if to hide themselves. It flies with a rolling movement, something like the Roller, taking rather slow flaps, and sometimes it mounts high in the air and descends to the ground with outstretched wings.

Mr. Holdsworth remarks of it:—"Its flight is heavy and flapping, like that of the Lapwings; but it runs lightly and fast; and when separated from its companions, I have more than once seen it running along behind the bund of a dry paddy-field, with head lowered and wings trailing on the ground, presenting a most curious appearance, as the colour of the back resembled that of the dry mud, and there was nothing to attract attention but the drooping black primaries."

Jerdon writes that it nods the head when it stops running; and Burgess states that it has the "habit of running for a distance at speed, suddenly stopping, erecting the body, and then starting off again." The fact is that it rapidly covers the ground owing to the length of its stride, and not to the speed of its movements. If its strides were, for instance, as rapid as those of many of our small Waders (Stints, &c.) it would move exceedingly fast. Its food consists of grasshoppers, Coleoptera, and various insects; the stomachs of some I shot at Aripu were filled with a large, flat, tick-like insect.

Nidification.—I was informed by natives on the north-west coast that this bird breeds there in the early part of the year; but I am not prepared to verify the statement, and am inclined to think it lays later on in the year.

In India it is stated to lay, as a rule, from March until July; of its nesting Mr. Hume writes:—"It scrapes a slight hollow in the ground, at times on a bare plain, oftener, I believe, under some tuft of grass or low bush, in stunted, straggling, dry upland jungle, and in it lays two or three eggs on the bare earth. I have never seen any lining, nor have I known of more than three eggs being found." The eggs are described as "very spherical and glossless; the ground-colour is a yellowish stone-colour or fawn-white, and they are closely mottled, spotted, and in some specimens lined all over with dull blackish brown and pale inky purple." They average in size 1·19 by 0·97 inch.

GRALLÆ.

Fam. GLAREOLIDÆ *.

Bill short, curved, the gape very wide, and the tip compressed. Wings very long. Tail short, either forked or even, of 12 feathers. Legs moderately long. Toes short; hind toe well developed.

Neck short. Of Swallow-like form. Of crepuscular habit. Sternum with a double emargination.

Genus GLAREOLA.

Bill short, the culmen somewhat compressed at the base, then slightly elevated and curved to the tip; gape very wide and receding; nostril oval and capacious. Wings very long, exceeding the tail, pointed; the 1st primary the longest, slightly exceeding the 2nd; tail broad, emarginate or forked. Tarsus slender, much longer than the middle toe, reticulated in front; tibia bare for the length of the hind toe and claw. Lateral toes very short and subequal, the outer slightly syndactyle; claws straight, the middle one slightly pectinated; hind toe elevated.

GLAREOLA ORIENTALIS.

(THE EASTERN SWALLOW-PLOVER.)

Glareola orientalis, Leach, Trans. Z. S. xiii. p. 132, pl. 13. figs. 1, 2 (1821); Kelaart, Prodromus, Cat. p. 132 (1852); Gould, B. of Austr. vi. pl. 23 (1848); Blyth, Cat. B. Mus. A. S. B. p. 259 (1849); Jerdon, B. of Ind. iii. p. 631 (1864); Gould, Handb. B. of Austr. ii. p. 245 (1865); Swinhoe, P. Z. S. 1871, p. 403; Ball, Str. Feath. 1873, p. 83; Hume, ibid. 1874, p. 284; Salvadori, Ucc. di Born. p. 319 (1874); Legge, Str. Feath. 1875, p. 371 (first *authenticated* record from Ceylon); Hume, Nests and Eggs, iii. p. 568 (1875); Hume & Davison, Str. Feath. 1878 (B. of Tenass.), p. 455; Oates, ibid. 1878, vii. p. 49; Davidson & Wenden, *t. c.* p. 88; Hume, ibid. 1879, viii. p. 69, et p. 112 (List Ind. B.).

The Oriental Pratincole, Latham; *Oriental Glareole*, *Larger Pratincole* of some.

Adult male and female. Length 8·8 to 9·3 inches (outer tail-feathers variable in length); wing 7·4 to 7·5; tail 3·0 to 3·2, depth of fork 1·0; tarsus 1·3 to 1·4; bare tibia 0·5; middle toe and claw 1·0 to 1·05; hind toe and claw 0·25 to 0·3; bill to gape 0·97 to 1·03; expanse (of one with wing of 7·5) 22·0.

Iris dark brown; bill black, the gape brownish, and the base of lower mandible and margin of upper, from gape to nostril, red; tarsi reddish brown, changing to plumbeous on the feet and tibia.

Head, upper surface, wings, sides of neck, and the chest brown, palest on the latter, and with a green lustre above, strongest on the scapulars; forehead and above the lores slightly darker; chin, cheeks round the gape, and throat buff, bounded all round by a black border, with a white inner edge, passing up to the anterior corner of the eye;

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* The true position of these remarkable birds has been the subject of much discussion. They differ from the rest of the Grallæ in their *Hirundine* or Swallow-like aspect and habits, and in their crepuscular disposition recall the Nightjars somewhat. In their anatomy, wing- and leg-structure, general mode of life, and in their nidification they are strictly a Plover form.

a white orbital fringe; quills and terminal portion of tail (deepest on the centre) blackish brown, illumined with green on the latter part; 1st primary-shaft white; breast pale rufous or tawny, blending into the brownish of the chest, which changes into the white of the lower parts, basal portion of tail, and upper tail-coverts; axillary plume and secondary under wing-coverts, which are much elongated, dark chestnut; primary under-coverts blackish brown; edges of feathers beneath the metacarpus white.

Young. The *chick* is a "mixed pepper-and-salt colour, the black preponderating" (*Oates*).

Birds of the year have the wing about 7·2 inches; bill, with the base of the under mandible and the margin of the upper at the gape not so red as in the adult.

The brown of the head and upper surface paler and margined with fulvous, the hind neck much pervaded with the latter, the buff of the throat not so pure as in the adult, and the feathers tipped with black, forming striæ, except at the chin; the black border is not clearly defined, and the white inner edge not distinct; chest a darker brown, and the feathers edged fulvous; breast less rufous, and the colour more confined to the centre, the sides being dusky; the outer under wing-coverts are edged with black, instead of being entirely chestnut. With age the black points on the buff throat disappear, but the gorget and white inner edge do not become clearly defined until the bird is matured: the chest loses its pale edgings, and the under wing-coverts become richer.

Obs. Ceylon specimens of this interesting species correspond well with Indian and continental birds. A Bangkok specimen, however, has the secondaries slightly tipped with white, though it corresponds in other respects with examples from Ceylon: it measures 7·5 inches in the wing; fork of tail 1·0.

G. orientalis differs from the European species (*G. pratincola*) in its less forked tail and in the absence of white tipping to the secondaries and paler head, besides which it is a smaller bird. In the *latter* the head is concolorous with the back, and has a sandy hue on the nape and hind neck. Four specimens from Africa and Southern Europe measure in the wing 7·5, 7·5, 7·6, 7·8 inches respectively: the depth of the fork of the tail varies from 2·0 to 2·3.

Glareola nordmanni, a Central-Asiatic species, has black axillaries and under wing-coverts, like *G. lactea*, is very similar on the upper surface to the two foregoing, but differs beneath in being greyish white from the chest downwards; the chest is light brown, and the throat paler than in the Indian bird; the secondaries, like it, want the pale tipping. Wing 7·5 inches.

G. grallaria, Temm., from Australia and some of the Malay islands, is characterized by its large size, square tail, and long legs. A Bouru example measures 8·0 inches in the wing, tail 2·5, tarsus 1·9. The under wing is black, and the flanks deep maroon.

Distribution.—As yet this fine Swallow-Plover has been found in very few localities in Ceylon. Kelaart includes it in his list, but from what district it is not stated, and subsequent observers seem to have passed it over. I met with it, for the first time that it was ever satisfactorily identified in the island, at Minery tank, on the 10th of July, 1875; and the first example shot was a female in a state of breeding. In the following month it was found in considerable numbers on the western shores of Kanthelai tank, accompanied by young, which had evidently been reared in that spot. I conclude that it breeds yearly about the grassy lands surrounding these large sheets of water; and probably some remain there throughout the year while their companions depart for other spots suitable to their habits in unfrequented portions of the island. That it wanders about is proved by the fact of an example having been procured on the Galle face, Colombo, by Mr. MacVicar, since my departure from the island. The specimen in question was observed by this gentleman flying about the beach on the 10th of September, 1876, and is now in the Colombo Museum.

I will not undertake to assert, however, that it is a permanent resident in Ceylon, as it is everywhere a bird of local and uncertain distribution; and it is possible that during the early part of 1875, at the time of bird-migration, large flocks may have gone south to Ceylon and remained there during the monsoon to breed.

By Jerdon it was said to be "found throughout India in suitable places, but chiefly in the cold weather;" but to this statement Mr. Hume takes exception, and writes in 1874 ('Stray Feath.' p. 285):—"My experience does not corroborate this" (Jerdon's) "view of the distribution of this species. I have never heard of this species occurring in Sindh, the Punjab, Rajpootana, or the Central Provinces, and it is of extreme rarity, as far as my experience goes, both in Oudh and the North-west Provinces; almost the only place in which I have known it to occur within these latter provinces has been along the Ganges from Futtehgurh downwards, and there only in small numbers and at comparatively rare intervals." Mr. Doig, however, has recently met with it in Sindh.

In the peninsula of India I find that Messrs. Davidson and Wenden record it from the Deccan, the former gentleman having met with it in the river Bhima during the cold season. As future observation renders the distribution of birds more thoroughly known, it will doubtless, from time to time, be found on the banks of various other rivers. Eastwards of the Bay it is a more common bird. Mr. Oates leads us to infer, in writing to Mr. Hume ('Nests and Eggs,' iii.), that it frequents the plains of Pegu in large numbers, and he subsequently found it breeding there. Further south, in Tenasserim, it is, according to Mr. Hume, "confined apparently to the cultivated and open lands of the central portions of the Province and the tracts west of the Sittang." Mr. Davison observes that it is not uncommon in the Malay peninsula; and the former gentleman cites Singapore as a locality in which it has been found. In the island of Penang, Mr. Wallace has obtained it; and on the Andamans and Nicobars it was occasionally met with by Mr. Hume and his party in 1873, though it is recorded as by no means plentiful. Southward of Singapore it ranges into Java, where it has been procured by Messrs. Leach and Horsfield; and though we have no record of its occurrence in Sumatra, it is, I think, evident that it must inhabit that island. It has been obtained by various naturalists in different parts of Borneo; beyond this island it extends through Timor to Australia, to which country, however, according to Mr. Gould, it can only be considered a rare visitant. In his 'Handbook' he refers to a pair in the collection of Mr. Alexander Macleay, of Sydney, which, it is presumed, were obtained in the northern regions, as subsequently Mr. Ramsay notes it from Port Darwin and Port Essington.

It has been procured at Bangkok, and doubtless it occurs at other places along the south-east coast of the continent to China, in which empire it is recorded by Swinhoe from Tientsin. It has likewise been observed in Formosa. It ranges into Mongolia, where, according to Prjevalsky, the northern bend of the Hoang-ho forms its limit to the north. He observed it in pairs and small flocks in the valley of this river from the town of Baut as far as the western portion of Muni-ul.

Habits.—As a Ceylonese bird this fine Pratincole frequents grassy meadows surrounding large sheets of water, and appears to confine itself to particular spots, although at sunset it probably moves about a good deal. I found it on the north side of the Minery Lake and on the west side of Kanthelai tank; but at each of these sheets of water it had evidently selected the spots I found it in for the purpose of rearing its young. Its ordinary flight is regular, and performed with not very rapid strokes of its pinions, and in its character resembles that of the Terns; but when hawking for insects, it dashes about, rising and falling, and twisting and turning in a very Swallow-like manner. I first met with it under these circumstances, and was attracted by its nocturnal movements, or I should most likely have passed it over. The scene was eminently characteristic of the wild jungle-regions of Ceylon. I had just been witness to a grand aerial tournament between a splendid pair of Sea-Eagles, which were breeding among the large trees on the colossal retaining bund of the tank, and a Fish-Eagle (*Polioaetus ichthyaetus*), which had evidently been trespassing on the preserves of its majestic relations. After admiring the grand evolutions and swoops of these noble birds, I descended to the grassy plains on the borders of the lake. The place was swarming with animal life: hundreds of cattle were scattered here and there as far as the eye could discern them in the dusk; little groups of unsightly buffaloes, some tame and some wild, were standing on various little eminences on the shore; an endless stream of Cormorants were wending their way across the water to some distant roosting-place; and, with the same object in view, a small "mob" of Pelicans were leisurely flapping off to the surrounding forests, in which the deep bay of the Sambhur deer could be distinctly heard. Presently my eye caught sight of a bird, then new to me, which was flying about, like a Nightjar, in pursuit of the moths with which the still hot air was swarming. It was the only specimen I saw that evening, and I had considerable difficulty in persuading my native attendant to wade into the lake into which it fell and retrieve it, so alarmed was he of the crocodiles which infested the water.

At Kanthelai, when I invaded the breeding-grounds of those which were frequenting the meadows on the west side, they flew overhead, crossing and recrossing me in front, but did not pass behind me. They uttered a *churr*-like note, and also a call of alarm like the "crake" of some small Terns. They once or twice poised themselves in the air over my head, endeavouring to entice me away from their young. These birds were invariably flushed from the ground on which they were reposing, and in no case did I observe them hawking for insects during the heat of the day. They would appear to feed chiefly in the evening, and perhaps also at early morning. The food of those I shot consisted of moths, caterpillars, and beetles, chiefly the latter.

Jerdon, who refers to their crepuscular habits, remarks, "It is generally found near large rivers, occasionally in very large flocks, hawking over the fields of grain or rumnahs of grass, catching insects in the air, and sometimes uttering its peculiar call when flying. Now and then small parties may be seen, long after sunset, flying round and round some small field or cultivated patch, pursuing moths or beetles, and now and then alighting on the ground. In the middle of the day it may be seen seated in large flocks at the edge of some tank, or on a sand bank in the river."

Mr. Davison records his observations of this species in Tenasserim as follows :—"It is, as a rule, shy and difficult to approach, and rises with a soft Plover-like note, *to wheet, to wheet*; they run rapidly, and when approached run some little distance before rising. . . . . I have repeatedly seen them high up in the air, hawking white ants and other insects; their flight is then very rapid and graceful, and very Swallow-like."

The *nidification* of this interesting bird has only of late been made known, through the researches of Mr. Oates in Pegu. In writing to Mr. Hume ('Nests and Eggs,' iii. p. 568), though up to that time unsuccessful in finding its eggs in Pegu, he describes the birds, when their breeding-grounds were invaded, as squatting on the ground with expanded wings and outstretched necks, trying to look as fierce as possible. Subsequently he remarks :—"I have found the eggs of this species from the 16th of April to the 1st May, on which latter date some eggs were fresh, but others incubated. Three appears to be the maximum number of eggs, but only two are more frequently laid. The eggs are deposited on the bare ground, burnt-up sandy paddy-fields being much frequented. No great number of birds breed together, nor have I ever found two nests very close to each other; the finding of eggs is consequently very laborious work. When disturbed, the sitting bird flies round one's head for a short time, and then goes away; but when the young are lying hid, then the birds display great anxiety, and it is on these occasions that the bird squats on the ground with wings outspread and neck outstretched. I fancy this action is meant to counterfeit lameness, and so draw the intruder off the scent. . . . . ." The eggs "are quite different from those of *G. lactea*. The ground is buff or stone-colour, and the whole shell is thickly blotched with blackish brown and underlying smears of paler brown sunk into the shell; other eggs are so thickly blotched as to appear black when viewed at a short distance off. They are without gloss and Plover-like; one end of the egg is much pointed. . . . . The average of a considerable series is 1·18 inch by 0·93." Mr. Doig, in his recent notes on this bird as observed on the Eastern Narra, Sindh, corroborates Mr. Oates's experience as to its stretching itself on the ground with expanded wings, but considers this habit is practised for purposes of concealment.

GLAREOLA LACTEA.

(THE SMALL SWALLOW-PLOVER.)

Glareola lactea, Temm. Pl. Col. pl. 399 (1838); Blyth, Cat. B. Mus. A. S. B. p. 259 (1849); Jerdon, B. of Ind. iii. p. 632 (1864); Hume, Str. Feath. 1873, p. 440; Legge, *t. c.* p. 490; Ball, ibid. 1874, p. 429; Hume, ibid. 1875, p. 179; Legge, *t. c.* p. 204; id. Ibis, 1875, p. 400; Hume, Nests and Eggs, iii. p. 568; Armstrong, Str. Feath. 1876, p. 338; Oates, ibid. 1877, p. 164; Hume & Davison, ibid. (B. of Tenass.), 1878, p. 454; Davidson & Wenden, ibid. viii. p. 88; Ball, *t. c.* p. 226; Cripps, *t. c.* p. 299; Hume, ibid. 1879 (List Ind. B.), p. 112.

Glareola orientalis (Leach), apud Jerdon, Cat. B. South India, Madr. Journ. xii. p. 215.

Glareola ——?, Legge, Mem. Hamb. B. Ceylon, Blue-Book, 1873, p. 11.

Glareole lacté, Temminck; *Lesser Pratincole* of some.

Adult male and female. Length 6·5 to 6·8 inches; wing 5·7 to 6·05; tail 2·0, falling short of closed wings from 0·6 to 0·8; tarsus 0·7 to 0·8; middle toe and claw 0·75 to 0·8; bill to gape 0·75 to 0·8; expanse 18·0. *The tail is not forked in this species.*

Iris dark brown; eyelid brown; bill black, gape and basal part of margins red; legs and feet neutral brown or plumbeous brown.

Male. Above, including the wing-coverts, uniform pale sandy brown, darker on the forehead, and passing from the sides of the neck in a paler wash over the chest; a white orbital fringe; quills, *axillary plume*, and *under wing-coverts*, with the terminal portion of the tail *black*, the latter decreasing in extent to the outer feather; at the middle of the 5th and 6th primaries a marginal spot; inner webs of primaries at the base, the secondaries, except at the tip and terminal outer edge, margins of the greater coverts, and some of the adjacent tertials white; chin albescent, blending into rufescent fulvous on the throat; upper tail-coverts, tail, lower parts, and breast white, blending into the pale brownish of the chest; tips of all but the two outer rectrices whitish.

Female. Differs (so far as I have observed) in wanting the white marginal spots on the 5th and 6th primaries, and in the less amount of black on the lores.

Young. Birds of the year have the upper surface fulvous brown, darker on the head, and with the tips of the feathers ochreous, with a dark crescentic ray; this is present even on the primaries; least wing-coverts more rufescent than the rest; tail blackish brown, changing to ochreous at the tips; chin and throat whitish, spotted with blackish brown; chest duskier than in the adult. Birds not quite mature have pale edges to the feathers of the upper surface, and the throat is faintly tinged with buff; the lores a little darker than the forehead. The gape is not so red as in the adult. Wing 5·4 inches.

Obs. The dimensions of Pegu specimens are given by Mr. Oates as follows:—length 6·7 inches; expanse 17·2 to 17·5; wing 5·7 to 5·8; tail from vent 2·1; tarsus 0·75 to 0·81. Mr. Armstrong records the measurements of a male shot near Elephant Point, Burmah, as—length 6·5; expanse 16·2; wing 5·5; tail from vent 2·15; tarsus 0·9. Ceylonese specimens therefore average larger than these eastern birds. Individuals in the national collection now before me, however, measure in the wing 5·7, 6·1, 6·3 inches respectively; they are from Dinapore and Northern India (localities not stated), and correspond almost entirely with Ceylonese specimens, though the throats are scarcely so brightly coloured, notwithstanding that the fulvous hue of the chest descends in a measure over the lower breast, which part is consequently not so white as in my insular specimens.

Distribution.—The Lesser Swallow-Plover was discovered by myself in June 1873 at Hambantota; I then for the first time procured specimens; but I had noticed it in March of the previous year on a salt lagoon near Kirinde. Large flocks frequented the hollows in the great sand hill west of the town, as well as the dried-up shores of the leways in the daytime, and assembled at twilight and at early morn to hawk over some swampy ground near the curious wells. They appear to be resident all the year round in this district;

the inhabitants of the town were familiar with them, and informed me that they bred in the sand hills in March. In the following October I received some specimens from Mr. J. Williams, of the Ceylon Public-Works Department. In October 1874 I met with a large flock frequenting the shores of Kottiar Bay, near the mouths of the Mahawelliganga. It is likewise to be found, I believe, in the north of the Jaffna peninsula, and was perhaps observed there by Layard, though he did not record it in his notes. When I described the bird to him in 1874, during our voyage to the Antipodes, he remarked that he believed he had seen it at Pt. Pedro on one or two occasions. I am not aware that it has been seen on the west coast.

On the mainland this little Pratincole is chiefly found from the Deccan north-eastwards to Bengal, and thence ranges into Burmah and Tenasserim. I do not find it recorded from the extreme south, and, in fact, Messrs. Davidson and Wenden's notice of it on the river Bhima, in the Deccan, during the cold season, is the most southerly register of its occurrence that I have noticed. Mr. Ball notes it from the Godaveri valley, Raipur, and Orissa north of the Mahanadi, also from Sambalpur, north and south of the same river, and finally from Lohardugga, Manbhum, and Bardwan. Captain Beavan likewise observed it on the sand banks of the Damoodah river, near the Manbhum district. It extends throughout Bengal and the North-west Provinces, breeding along the banks of the Ganges and Jumna, and is also recorded from the Nerbudda and the Indus; and to this latter river it would appear to resort in the Punjab to breed, for it is not said to inhabit Sindh at all. Turning east again we find Mr. Cripps writing of it as being rather common in Furreedpore, frequenting sandy churs on the main rivers.

Captain Feilden and Mr. Oates notice it as common on the sand banks of the Irrawaddy; and Dr. Armstrong met with it near Elephant Point, although it was rare there. It does not range far towards the south, being recorded, as regards Tenasserim, only from the tract of country between the Salween and Sittang rivers, where it was met with by Mr. Davison on small creeks or in the Thatone plains.

Habits.—The Lesser Pratincole delights in sand banks and bare places near water. The great red sand hills near Hambantota, where I first discovered it in Ceylon, formed a splendid shelter for it; in the hollows of this vast formation it was found in little troops of a dozen or more, reposing during the heat of the day, in company with small flocks of the large Sand-Plover (*Ægialitis geoffroyi*); or else the dry foreshores of the salt lagoons were resorted to, and there it might be seen sitting in pairs or several together in scattered company.

It is just as crepuscular, if not more so, than the preceding species; long after sunset, when it could scarcely be seen in the dusk of the evening, I noticed it hawking for insects about water-holes, flying very rapidly, with something of the action of the Nightjar, but with more speed and power; in the early morning it commenced again to feed, but desisted about 6 A.M., and scattered over the district to rest in the localities above named. When roused in the daytime, its flight is like that of the Lesser Tern; but it can at once be distinguished from this bird by the black axillaries and under wing-coverts. It walks slowly but easily, taking a few little paces and then halting. Its food in Ceylon consists of grasshoppers, moths, flies, and green bugs, of which latter it devours enormous quantities.

Jerdon writes of it, "Now and then large parties are seen hawking over the plains and fields; but it prefers hunting up and down the banks of rivers, over sandy churs, and by large tanks. In localities where they abound, vast parties may be seen every evening after sunset taking a long flight in a certain direction, capturing various insects as they fly. They live entirely on insects, which they capture in the air, in many cases Coleoptera. Several which I examined had only partaken of a species of *Cicindela*."

The Pratincoles were originally styled *Perdrix de mer* by the French, a name singularly inappropriate.

Nidification.—In the south-east of Ceylon the small Swallow-Plover must breed at the beginning of the year; for I shot the young in yearling plumage in June. They evidently nest on the great sand bank. In Northern India it breeds in March, April, and May, and nests in company with Terns and Skimmers (*Rhynchops*), depositing its eggs a little apart from these latter birds. Mr. Hume thus writes of its nidification:—"The nests are mere holes in the sand, three inches or so across, and an inch or an inch and a half deep. Where the bank is absolutely unfrequented and unvisited, there these holes are scratched in the open, without the slightest attempt at concealment; but where boatmen towing boats are passing from time to time, there the birds generally make their nests at the roots of, and partly concealed by, tufts of grass or

tamarisk-bushes. The nests are never lined in any way. Four is the full number of eggs; but three, and even two, are often found much incubated. . . . . The strange antics played by these little birds, at least those of them that had young or hard-set eggs, whenever we approached their treasures were very remarkable: flying past one they would come fluttering down on to the sand a few paces in front of one, and there gasp and flutter as if mortally wounded, hobbling on with draggled wings and limping legs as one approached them, and altogether simulating entire helpless and completely-crippled birds. . . . I have seen Peewits and other Plovers behave somewhat similarly; but these little Pratincoles seem to me to be cleverer performers than any birds I had ever seen."

GRALLÆ.

Fam. HÆMATOPODIDÆ.

Bill long or stout. Wings lengthened. Tail moderately short, of 12 feathers. Legs moderate, the anterior toes connected by a web moderately developed; hind toe wanting.

Of moderately large size, without a change of plumage in the summer. Of purely littoral habit; gregarious; shellfish eaters.

Genus HÆMATOPUS.

Bill long, straight, compressed from the nostrils to the tip, which is slightly obtuse; the commissure ascending from the centre to the tip; nostrils linear, placed in a membrane at the base of a long groove. Wings long, pointed, the first quill the longest; tertials lengthened. Tail short, of 12 feathers. Tarsus stout, short, and reticulated in front and behind. Toes short, broad, connected at the base by a web, considerably developed between the outer and middle toe, and extending along the sides as a narrow membrane; nails broad and short; hind toe wanting.

Palate bony.

HÆMATOPUS OSTRALEGUS.

(THE OYSTERCATCHER.)

Hæmatopus ostralegus, Linn. Syst. Nat. i. p. 257 (1776); Gould, B. of Eur. pl. 300 (1837); Jerdon, Madr. Journ. 1840, xii. p. 201; Blyth, Cat. B. Mus. A. S. B. p. 264 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 110; Schrenck, Reis. u. Forsch. Amur-L. p. 413 (1860); Schlegel, Mus. P.-B. *Anseres*, p. 70 (1864); Jerdon, B. of Ind. iii. p. 659 (1864); Holdsw. P. Z. S. 1872, p. 472; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1039 (1873); Hume, Str. Feath. 1873, p. 234, et 1879, viii. (List B. of Ind.), p. 112; Irby, B. of Gibraltar, p. 163 (1875); Legge, Str. Feath. 1876, p. 234; Seebohm & Harvie Brown, Ibis, 1875, p. 290; Dresser, B. of Eur. pls. 63, 64 (1877); Butler, Str. Feath. 1877, p. 212.

Hæmatopus hypoleuca, Pallas, Zoogr. Rosso-As. ii. p. 129 (1811).

?*Hæmatopus osculans*, Swinhoe, P. Z. S. 1871, p. 405; id. Ibis, 1875, p. 129; David & Oustalet, Ois. de la Chine, p. 432 (1877); Blakiston & Pryer, Ibis, 1878, p. 219.

L'Huîtrier, Buffon; *Sea-Pie*, popularly in England; *Scholekster*, Dutch; *Ostraceiro*, Portuguese; *Austernfischer*, German. *Darya gajpaou*, lit. "Sea Longshanks," Hind.; *Yerri kali ulanka*, Telugu; *Tetawuk*, Kabul (Blyth).

Female, full-grown (Ceylon, March). Length 17·0 inches; wing 10·0; tail 4·0; tarsus 2·13; bare tibia 0·8; middle toe and claw 1·7; bill to gape 3·25, at front 3·2.

Adult female (Wales, November). Length 16·3 inches; wing 9·6, expanse 31·0; tail 4·0; tarsus 1·9; middle toe and claw 1·6; bill to gape 3·0, at front 2·85: weight 15¼ oz. A series of English and European examples measure:—wing 9·4 to 10·3; tail 3·9 to 4·0; tarsus 1·8 to 2·15; middle toe and claw 1·6 to 1·7; bill at front 2·45 to 3·1.

Adult male (Kurrachee). Length 15·5 inches; wing 10·0; tail 4·4; tarsus 2·1; bill at front 3·1. Weight 1 lb. 6 oz. (*Hume*.)

Female (Cheefoo: *H. osculans*). Length 19·5 inches; wing 10·6; tail 4·65; tarsus 2·2; bill at front 4·0 (*Swinhoe*).—*Male* (Shanghai: *H. osculans*). Length 18·5 inches (0·47 m.); tail 4·3 (0·11 m.); tarsus 2·17 (0·055 m.); bill at front 3·95 (0·10 m.) (*David*).

Obs. The bill of the Oystercatcher varies greatly in length, depending on the degree in which the tip is worn off: many examples shot on rocky coasts have the extremities quite truncated, measuring perhaps $\frac{1}{12}$ inch in width, the appearance of the outer surfaces of the mandibles showing that this is the result of friction; the Chinese form, *H. osculans*, which I doubtfully include with ours, appears to have normally a considerably larger bill, as will be seen by the above measurements; Mr. Hume gives the extreme length in Indian specimens as 3·6 inches. Asiatic specimens appear to *average* larger in the tarsus than European.

Iris variable, orange-red, red, brownish red; eyelid orange-red; bill orange-red at the base, the terminal half of the upper mandible changing to blackish, and the tip of the lower mandible to brownish; legs and feet dusky purplish (in spring purplish pink); feet duskier than the tarsus.

Head, entire neck, and upper back uniform coal-black, with a small white patch beneath the eyelid; scapulars, tertials, wing-coverts, primaries, and the terminal portion of the secondaries and terminal portion of the tail brownish black, not so intense as that of the head and throat; greater wing-coverts, except at the base, the inner secondaries entirely, and the rest, with the exception of the above-mentioned portion, white; the greater part of the inner webs of the primaries, from the base outwards, white, running onto the centre of the outer webs of all but the first two primaries, and ending on the third in an elongated shaft-patch; first two primary-shafts white near the tip, the remainder white where the webs are this colour; entire under surface, with the under tail-coverts and under wing, as also the back, rump, upper tail-coverts, and basal two thirds of the tail, white.

In winter specimens which I have examined there is generally a more or less extensive white bar across the upper part of the throat.

Nestling, in down. Above iron-grey, mottled with buff, darkening into blackish on the throat; sides of the rump and the tail black; crown with a large patch of black, and mottlings of the same on each side; a black stripe through the lores; two stripes of black down the back, and another along the wings; beneath white. Bill at front 1·0 inch.

Further stage. Wings and breast feathered; crown and ear-coverts pure black; rest of the head and neck in down as above; a dark stripe on each side of the chin; back and wing-coverts brownish black; primaries and secondaries as in the adult; tertials and wing-coverts tipped with rufescent; tail in down still; a black patch on each side of the fore neck; the feathers at the junction with the white tipped with rufous; there is *no trace of white* across the throat; below the chest white; bill at front 1·4 inch, yellow at the base, tip black; feet yellow.

Immature, first autumn. Black of the upper surface not so intense as in the adult; the scapulars and wing-coverts brownish black, tipped finely with fulvous; the *terminal portion of the longer upper tail-coverts* black, barred with fulvous or deeply tipped with the same; coloration of the throat variable, in some with a broad white band running up in a point towards the chin, in others with scarcely a trace of white.

Obs. The excessive development of the white on the throat in immature birds I believe to be an individual peculiarity. The example above detailed from Ceylon, which must be nearly a year old, is a case in point; the white throat-band is an inch wide, and extends forward in a stripe to the chin; there is more white than usual on the primaries and secondaries, extending to the 2nd primary and also to the tertials; and the upper tail-coverts are entirely white, which is unusual in a bird not fully adult.

The Chinese form, *H. osculans*, Swinh., appears to me scarcely worthy of separation, being merely a somewhat larger, longer-billed form, with perhaps less white on the primaries. Swinhoe describes the first three primaries as black; should this character be constant, the race might perhaps be considered distinct. The black tipping of the upper tail-coverts, however, is quite a worthless diagnostic, as it exists in the European bird.

H. longirostris, Gm., found in Australia, is allied to the European bird, but has the axillaries black and white, and the black of the throat descending upon the breast; the upper tail-coverts are tipped with black, and the black portions of the plumage glossed with green. It is likewise longer in the wing; an example in my collection measures—length 17·8 inches; wing 11·2; tail 5·0; tarsus 2·3; bill at front 3·03.

H. unicolor, Forster (*H. fuliginosus*, Gould), inhabiting the same region, is entirely sooty black. Length 18·0 to 18·5 inches; wing 11·3 to 11·75; bill at front 3·0 to 3·2. Both these species feed largely on mussels.

The African Black Oystercatcher is *H. moquini*, Bp. There are other American species—*H. ater* and *H. palliatus*.

Distribution.—The Oystercatcher is a rare species in Ceylon, and probably not a regular seasonal visitor. It is only found in the north and on the northern half of the west coast; and during several years' sojourn at Aripu Mr. Holdsworth does not appear to have met with it. Layard records only seeing one or two specimens in the month of January in the Jaffna estuary. In March 1876 I met with about half a dozen on the Jaffna Lake, near Kalmunai Point, several on the Erinativoe Islands, and a small flock on the Manaar flats. In October of the same year I saw three on the curious ledged beach near Chilaw, which would be sure to attract them were there any on that part of the coast. On the east coast I never met with it.

The range of this species is very great, extending from Greenland, in the south of which several examples have been killed, across the entire continent of Europe, taking in North Africa and a large portion of the east coast of that continent, to Asia, across which it ranges to Japan and China and southward to Ceylon. Jerdon remarks that it is found on both coasts of the peninsula of India; but as regards the eastern side, I find no record of its having been recently found north of the Godaveri, and it has not been noticed on the Burmese coasts. It is a winter visitor to the west coast, and not uncommon, according to Jerdon, at Tellicherry. Towards the north it is said to be common on the Kutch and Kattiawar coasts, and in Kurrachee harbour Mr. Hume found it to be abundant, and in the hot season it has been noticed there by Capt. Butler; this gentleman likewise observed it in numbers at Mandavee. Along the Mekran coast and in the Gulf of Persia it is not uncommon, as also on the shores of the Caspian Sea. Severtzoff says that it breeds in the north-west of Turkestan, the locality being, I presume, the shores of the Sea of Aral or the banks of the Syr-Daria. In Western Siberia it ranges far to the north, as Dr. Finsch observed it on the Ob nearly as high as Obdorsk;

not so, however, further east, where the Amoor appears to be its most northern limit. In this region Schrenck records it from the mouth of the Ussuri, which enters the Amoor a long way from the sea, and obtained it on the latter river lower down. Middendorff procured it also on the Shantar Islands in the Sea of Okhotsk; and Pallas records it from the coast of Kamtschatka and the Kurile Islands. If we unite the Chinese species with it, we find this Oystercatcher in Japan on the island of Yezo and about Yokohama. Southwards it is found in limited numbers as far down the Chinese coasts as Swatow, breeding in Talien Bay.

Turning towards Western Asia, we find it recorded from Asia Minor; but it was not noticed by Canon Tristram in Palestine. Messrs. Elwes and Buckley observed it at Salonica, where it is not common; but on the coasts of the Black Sea it is pretty generally distributed, according to Von Nordmann, though it does not winter on the north coast. It occurs in Sicily, Malta, and Sardinia in spring and autumn, and in the latter island is also found at all seasons, according to Mr. Brooke. It is rare in Italy, being found there chiefly in winter and spring; and on the coasts of the Epirus it was only seen by Lord Lilford in March and April. In Transylvania it is rare, and met with chiefly during spring migration to the north. It is not very common anywhere in Germany or Poland; and in these countries, as also to the northward, is chiefly found in the breeding-season, arriving in Denmark and Sweden in March, and further north, in Finland, in April. Mr. Durnford found it breeding in the North-Frisian islands in May. In Northern Russia it is not uncommon in the breeding-season, particularly on the White Sea; and Messrs. Seebohm and Harvie Brown found it on the Petchora as far north as the Arctic circle. It is common in Sweden, and in Norway some remain during the winter on the south coast. It is a resident in Great Britain, breeding in the Farne Islands and in Scotland. In the Faroes it is common, and breeds in numbers there; and in Iceland it is also not uncommon, frequenting the south coast even in winter. It is most abundant on the English coasts in autumn and winter; and in Belgium and France where it is common, it is chiefly an autumn, winter, and spring resident. In Portugal it is well known; and on the south coasts of Spain it is found from autumn till spring, the latest recorded by Col. Irby having been seen by Lord Lilford on the 5th of May near the mouth of the Guadalquivir. In Morocco Favier says that it is a bird of passage, passing north in April and May, and returning in October. In the Red Sea, curiously enough, it seems to be a resident. Von Heuglin met with it in pairs and families throughout the summer near Qoseier, Suakin, in the Dahlak Islands, at Amphila and Belul; and in November and December he saw it on the Somauli coast. On the Egyptian coast Capt. Shelley only met with it in winter. It appears to extend down the east coast to Mozambique, where it has been observed by Peters. It likewise strays down the west coast, for there is a specimen in the Leyden Museum from Senegambia; but elsewhere in that region it has not been observed.

Habits.—This well-known bird is, next to the Common Curlew, one of the most wary species that frequent the shores of the Old World; yet at times it will admit of a near approach, particularly when there is a strong wind blowing from the sea, and it happens to be resting in a little flock on some rock near the water's edge. At such a time it will also fly pretty close to the fowler; and I have known a man to kill more than a dozen out of a closely packed flock at one shot. In rocky districts it always frequents the rocks which are uncovered at low water, and subsists on limpets, mussels, and other shells, which it strikes from the rocks or divides asunder with a sharp blow of the bill. The constant wear to which the tips of the mandibles are thus subjected soon blunts them, and they become quite stumpy. Its food, however, on sandy shores, and particularly in the tropics, where the above-mentioned shellfish do not exist in such numbers, consists almost entirely of sea-worms and slugs, minute bivalves, and crustaceans, which I have found swallowed whole in its stomach; and it is noteworthy that the mandibles are not found so much worn down as on the rocky shores of temperate seas. It generally associates in small families or troops of from six to a dozen; but in the early winter in Europe it collects in much larger flocks. Its note is a clear and loud whistle, which it utters sometimes in consort just before the troop take wing from the rocks, and also when they are on the wing; when single birds are flushed, they generally utter their whistle, perhaps as an alarm-note to their companions, who may be not far off. Its flight is swift, strong, and straight-on-end, and performed with quick, far-reaching strokes of its pinions, which are held extended above the back as it alights. As must be apparent, the name given to this bird is a misnomer, as oysters are not, as a rule, found clinging to rocks uncovered by the tide; and it is a question whether the bird *ever* eats an oyster. It displays admirable dexterity in manipulating the shells of

its favourite food, the limpet and the whelk; and as illustrative of its adroitness I transcribe the following interesting paragraph, contained in Mr. R. Gray's 'Birds of West Scotland,' and quoted by Mr. Dresser in the 'Birds of Europe':—

"I recollect seeing about thirty in a flock pitch upon a shelving rock, from which the waves had just receded, and commence an attack upon the limpets, which were very numerous. Being within three or four yards of them, I could distinctly perceive their movements, and could not help being struck with their dexterity in overturning the shells and scooping out their contents. Sometimes a bird would run forward to a limpet, and bend down its head sideways, as if in a listening attitude; then it passed to another and another, repeating the scrutiny, apparently to see if the shell was at all raised from the rock, until it found one ready for treatment, which it immediately put in force by thrusting its thin pointed bill suddenly between the edge of the limpet and its point of attachment, and turning it neatly over. One foot was then placed on the object and the animal taken out as clearly as if done with a knife or other sharp instrument. Another favourite feeding-ground is some sheltered bay, where a pair or two will often station themselves for a few hours, boring the wet sand for annelids, which I have seen them pull out of their burrows, and carry to the water for a slight rinsing before being swallowed."

Mr. Thompson made many observations as to the feeding of the Oystercatcher in Ireland, and he found the stomachs of those he examined to contain chiefly mussels, whelks (with their opercula), and limpets. Twenty-five well-sized limpets and about fifty opercula of whelks were found in the crop and gizzard of one example, and in another were a quantity of tender roots and green leaves, with white worm-like larvæ.

The Oystercatcher swims well, and sometimes takes to the water of its own accord, unlike most members of the family. Mr. Durnford remarks that he saw one swimming in the sea off the North-Frisian island of Sylt.

Nidification.—The Oystercatcher breeds in May and June, nesting on shingle near the water or on sand banks or stretches of gravel, and sometimes several pair lay not far from each other. The last-mentioned writer speaks of finding about a hundred pairs breeding in one locality in North Frisia. The nest is a hollow scraped in the shingle or sand, and is sometimes lined with a stray leaf or two or a few grass-bents, but often devoid of any lining at all. A curious site is recorded by Mr. Dresser as having been observed by a naturalist in Norway, and which was a hollow on the top of a felled pine log, in which a nest was constructed. The eggs are three or four in number, and are broad ovals, some slightly pointed at the small end, others scarcely so. A fine series of Mr. Seebohm's now before me are of various shades of grey and stone-buff, and are characterized by their black, bold, somewhat regular-edged and openly-distributed markings, beneath which are small and indistinct bluish-grey spots; the larger spots are collected round the large end, but are not, as a rule, closely set; in some they take the form of immense blotches or clouds, and these eggs are marked with a few dark grey underlying clouds; two have the obtuse end covered with broad hieroglyphic-like streaks crossed and recrossed over one another. They vary in size from 2·31 by 1·53 inch to 2·0 by 1·55, the latter dimensions being those of a very short, rounded egg. A long pointed specimen measures 2·35 by 1·48 inch.

GRALLÆ.

Fam. DROMADIDÆ.

Bill moderately long, stout, with the gonys-angle much pronounced. Legs long. Toes much webbed; hind toe present and well developed.

Genus DROMAS *.

Bill longer than the head, stout, the commissure straight; the culmen curved from the middle, and the upper mandible vaulted; gonys very long, with the gonys-angle pronounced and near the base; nostrils oval, and pierced through the bill. Wings moderately long, with the 1st quill the longest. Tail short and rounded. Legs long; the tarsus scutellate, and more than twice the length of the middle toe; outer toe long, anterior toes connected for nearly half their length by a web, and continued as a narrow membrane along the edges; middle claw pectinated at the tip.

DROMAS ARDEOLA.

(THE CRAB-PLOVER.)

Dromas ardeola, Paykull, Homell, Ac. Vet. Stockholm, p. 188, pl. 8 (1805); Blyth, Cat. B. Mus. A. S. B. p. 276 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Heuglin, Ibis, 1856, p. 346, et Orn. N.Ost-Afr. ii. p. 1043 (1873); Blyth, J. A. S. B. xxi. p. 352; Jerdon, B. of Ind. iii. p. 658 (1864); Layard, B. of S. Afr. p. 372 (1867); Blyth, Ibis, 1867, p. 166; Newton, *t. c.* p. 351; Blanford, Zool. Abyssinia, p. 432 (1870); Holdsw. P. Z. S. 1872, p. 472; Van der Hoeven, Annotationes de *Dromade ardeola*, Nov. Act. Acad. L.-C. Nat.-Cur. vol. xxxiii. (1868), p. 281; Hume, Str. Feath. 1873, p. 234, et 1874, p. 293, et 1876, p. 464, et 1879, viii. (List Ind. B.), p. 112 et p. 381; id. Nests and Eggs, iii. p. 584 (1875); Legge, Str. Feath. 1875, p. 220, et 1876, p. 246; Butler, ibid. 1877, p. 212, et 1878, vii. p. 186.

Tringa, sp.?, Salt, Travels Abyssinia, App. iv. p. 49 (1814).

Erodia amphilensis, Salt, Trav. Abyssinia, App. iv. p. 61, pl. (1814); Jardine & Selby, Ill. Orn. ii. pl. 75 (letterpress).

Ammoptila charadroides, Jerdon, Madr. Journ. 1840, xii. p. 216.

Abyssinian Erody, Lath. Gen. Hist. pl. 149 (1824); *Drome Ardeole*, Temm. Pl. Col. pl. 362; *Pied Erodia*, Jard. & Selby; *Sand-Plover*, Jerdon, Madr. Journ.; *Crabcatcher* of some. *Hanker*, Arabic.

Adult male and female (Ceylon). Length 15·7 to 16·2 inches; wing 8·2 to 8·5; tail 2·75 to 3·0; tarsus 3·6 to 4·0; bare tibia 1·4 to 1·6; middle toe and claw 1·7 to 1·85; bill to gape 2·9 to 3·0.

Iris dark brown; bill black; legs and feet pale bluish leaden or light greyish blue, claws black.

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* This singular genus, the only one of its family, is perhaps the most perplexing form among all the Grallæ. Blyth and Layard follow Schlegel in considering it allied to the Terns, the former stating that its young plumage was that of the Sterninæ; but in this he is scarcely correct. Bonaparte held that it was close to the Oystercatchers; and more recently Van der Hoeven has proved that in its anatomy it is close to *Hæmatopus*, which species I find it much resembles in habits. In its nidification and eggs, however, it has affinities with the Shearwaters; and these anomalous characteristics induce me to place it in a family of itself. Its resemblance to the Œdicnemidæ is, in my opinion, only superficial.

Head, hind neck, entire under surface, lower back, upper tail-coverts, shorter scapulars, lesser wing-coverts, a patch below the winglet and entire under wing, except the terminal half of the primaries, white; the occiput nearly always faintly sullied with greyish; a black spot in front of and behind the eye; scapulars, tertials, and median wing-coverts passing from whitish at the base into very pale greyish at the tips; centre tail-feathers and outer webs of the rest of the same colour, paling into whitish on the inner webs; lower part of hind neck, interscapular region, innermost row of the scapulars, outer webs, and terminal portion of the primaries and their coverts, secondaries, greater wing-coverts, and winglet black, passing on the inner webs of the wing-feathers into white, and glossed perceptibly on the back with green.

Nestling in down. "Above dark grey, beneath white. Iris fuscous, bill blackish; feet pale leaden." (*Von Heuglin.*) Captain Butler writes me that the nestling brought to him from the Persian Gulf was covered with uniform greyish-white down, with black bill and dark legs and feet.

First plumage (Massowah). Head and hind neck grey, the feathers with black central stripes: lower hind neck, interscapular region, and the innermost scapulars greyish black, the feathers margined with brownish grey; scapulars, tertials, and wing-coverts smoky grey; primaries and secondaries brownish black; tail smoky grey, tipped with white; beneath white, tinged with grey across the chest; the grey chest and the pale margins of the interscapular feathers are the signs of the first plumage. In the *following winter* the head is whitish, the black stripes contrasting more with the margins of the feathers than in the quite young bird; the interscapulars are blackish pervaded with grey, but not conspicuously margined as before; the grey hue of the wings and tail paler than before; under surface all white. In the *second year* the occiput, nape, and down the centre of the head are light ashy grey, the crown having become almost white; and the black portions of the plumage are quite as glossy as in the adult. In this dress birds are often procured in Ceylon.

Obs. Indian examples correspond with Ceylonese in size. Those I have examined measure:—wing 8·3 to 8·6; bill to gape 2·9 to 3·2 inches. Mr. Hume gives the dimensions of four Andaman examples as:—Length 15·65 to 16·0; wing 8·05 to 8·3, expanse 28·5 to 29·5; tail 2·75 to 3·0; tarsus 3·5 to 3·75; bill from gape 2·75 to 2·8: weight 15 to 17 oz. The latter item, considering the size of the bird and its large head and bill, is noteworthy. Von Heuglin's measurements of North-east African examples do not equal those of Asiatic birds; but those of a Red-Sea specimen, referred to above, do; and Layard gives the dimensions of South-African examples as—wing 8·0 inches; tail 2 inches 9 lines. Von Heuglin's are:—length $14\frac{1}{2}$ inches; wing 7 inches 8 lines to 7 inches 10 lines; tail 2 inches 6 lines; tarsus 3 inches $3\frac{1}{2}$ lines to 3 inches 8 lines; bill at front 1 inch $11\frac{1}{2}$ lines (?) to 2 inches 3 lines.

Distribution.—The Crab-Plover is found chiefly on the north shores of Ceylon. It occurs also on the Jaffna islands, having been sent to Sir W. Jardine from Delft. On the east side of the island I have met with it as far south as Trincomalie; and I have no doubt it will occur as a straggler down the whole of the coast; on the west side it is common as far as Manaar, and an occasional visitant to places as far south as Colombo, where it has occurred but once to my knowledge, when an example was shot by Mr. Bligh on the Galle face, on the 14th October, 1871. Further north it was procured by Layard on the Calpentyn lake. On the Manaar sand flats it was observed by me in great numbers in March 1876, and I have no doubt that it frequents, and perhaps breeds on, the sand banks of Adam's Bridge. I saw it higher up the coast on the same occasion, but did not meet with it at Jaffna. In the Trincomalie district it is not uncommon, and frequents the shores of the salt lagoons and the mouths of the estuaries by which these backwaters discharge into the sea. On the Peria-kerretje lake it is, perhaps, as numerous as anywhere in that district; for I have met with it there in small flocks of half a dozen or more. I have not noticed it anywhere in the hot season (May to September); and it is probably, for the most part, a cool-weather visitant to Ceylon, departing north to the coasts of India in April, although some most likely remain throughout the year and breed in the locality above mentioned. The sand banks of Adam's Bridge should certainly be explored with a view to the discovery of a breeding-place of the species among them.

The habitat of the Crab-Plover may be said to consist of the shores of the Indian Ocean, including some of the Mascarene islands from Natal northwards to the Red Sea, then round the coasts of Arabia, Persia, and India down to Ceylon, including the Laccadive group, and thence up the east coast as far as Nellore, and perhaps further north, and finally extending eastwards to the Andamans and Nicobars.

Commencing with the last-named islands we find Von Pelzeln recording it as having been procured by

the 'Novara' Expedition; while in the Andamans it was procured by Capt. Ramsay at South Andaman, Port Blair, and Macpherson Straits, at which latter place Mr. Hume likewise procured it. It is further recorded by Capt. Beavan as being very common on those islands. On the east coast of the Indian peninsula Jerdon observed it far from rare near Nellore at the mouths of rivers and along backwaters. It was met with on the east coast by Mr. W. Elliot, and in the Laccadives Mr. Hume saw a flock at Pere-Mull-Par in February. On the coast of Kattiawar it has been procured, and in Kurrachee harbour it has been seen in January, and during the hot season by Capt. Butler, who likewise obtained it at Mandavee. Writing in 'Stray Feathers,' 1878, p. 186, he says, it is not very uncommon at Kurrachee, and breeds in the Persian Gulf, as a young bird was caught in June on one of the islands opposite Bushire. It was also procured at Baba Island, west of Sindh, by Major Le Messurier. Along the south coast of Arabia it must needs occur, as in the Gulf of Aden and southern portion of the Red Sea it is, according to Von Heuglin, common. This is one of its great breeding-grounds; but northwards of the tropic, this writer says, it only occurs as a straggler. It is resident here on the low-lying parts of the coast and on the coral islands, living in pairs and families, except in late autumn and winter, when it assembles in flocks.

On the Abyssinian coast Mr. Blanford likewise discovered it; he writes that it is not uncommon, associating there in flocks; it was obtained by Salt on the coast of this country, behind the village of Madir, in the Bay of Amphila, from which he took its specific title of *amphilensis*. It extends down the entire coast to Natal, where Mr. Ayres procured it. In this region Layard says, in his 'Birds of South Africa,' that its favourite localities are sand banks far out to sea; it is apparently, however, rare so far south as Natal. From Madagascar Hartlaub, Schlegel and Pollen record it; the latter authors write, in their 'Recherches sur la Faune de Madagascar,' that it is not rare in the north-west of this island, being found along the coasts in flocks of from six to twelve. In the Seychelles, Mr. E. Newton procured it on the island of Curieuse, and was told that it was not uncommon there, but that seldom more than two or three were seen together. This was in the month of February.

Habits.—This remarkable bird, concerning the true position of which there has been so much difference of opinion, is strictly an inhabitant of the sea-shore, frequenting sand banks, beaches, the edges of salt lagoons and backwaters, and, in some places, coral reefs, to which it appears to be especially partial. In its flight, its sociable habit of collecting in little flocks (which rest in close company on rocks, sand banks, or other spots at the edge of the tide), its mode of feeding, and finally in its note, and the way this is sometimes uttered in consonance, it closely resembles the Oystercatcher. Layard, who followed Schlegel and Blyth in considering it allied to the Terns, appears to have observed it flying past him out at sea; but it is not its habit to leave the sea-shore, unless flying to some given point; and if he met with it off the island of Manaar, it was probable that the birds seen were flying from the sand banks of Adam's Bridge to the mainland. Though sociable at times when feeding, they are often seen singly or two or three together, walking about with quick short strides and erect carriage, stopping every now and then to make a peck at some object of their search. When solitary it is very wary, and invariably gets up before one is within gunshot; but when in little troops it is not so shy, and may be approached tolerably close. Its highly webbed feet enable it to swim well; and one which I winged swam so fast that it nearly escaped into deep water before I could stop it with a second shot. When feeding they are silent; but when packed in flocks and alarmed by the approach of some one, or when being joined by some of their fellows, they utter a loud and not unmusical note in consonance, which, mingled with the roar of the surf, has a peculiarly wild and pleasant sound. I have always found the remains of crabs in the stomachs of those I have examined; but Von Heuglin says they also feed on worms, spawn, and small fish, which is the diet spoken of by Schlegel; Salt, however, states that the pair he shot in the Bay of Amphila had their stomachs full of locusts. The curious calling-crab (*Gelasinus*) and the burrowing sand-crab (*Ocypode*) form the main portion of their diet in Ceylon; their powerful bills are well constituted for the disposal of such prey, and, judging by the scratched appearance of the mandibles, the hapless crustaceans often show fight before they are dismembered. The body of the crab is broken by a stroke of the heavy bill, and the contents devoured, after which the Crab-Plover swallows the claws whole. As above remarked, they are sociable birds; and Mr. Hume has noticed them at high water, collected together in a dense crowd, as closely packed as they could stand on a single isolated rock. They consort but little with other species, according to my experience, the Greenshank being the only bird I have seen in company with them. Von Heuglin,

however, speaks of it mingling with other shore-birds, which place themselves under its leadership, as nothing escapes its sharp scrutiny. The flight of the Crab-Plover is tolerably swift; it is low and straight, and performed with sharp but rather slow-timed beatings of the wings, with the legs carried out behind it; and when a flock fly together, they pack as closely as any shore-bird in existence. The last-named author has noticed that they sometimes depress their wings and lower the head and neck like long-necked Sandpipers; this, it is presumed, happens when they are about to alight. He also observed that at low water they were to be seen between half-dry coral banks, each pair or several pairs occupying a fixed hunting-ground, about which they either ran or flew, reminding him in this respect of the "Thicknees." Schlegel remarks that when surprised they run with great speed, frequently stopping and turning round the head before flying off; at twilight he noticed they were less shy, and permitted a near approach; he likens the note to the syllables *koak, koak.*

Nidification.—The nidification of this curious bird was made known by Von Heuglin, who found it nesting on sand banks in the Red Sea. It has also been found breeding, by collectors of Captain Butler, on an island in the Persian Gulf, and eggs sent home as belonging to it, which are considered by this naturalist to have been satisfactorily identified. Von Heuglin thus describes the breeding-grounds of the Crab-Plover:—"The nesting-places are on flat and lonely coral islands, more or less far from the edge of the water, and always in spots where banks of sand and small shell-fragments have been formed. Numbers of crabs generally live in these banks in deep slanting holes, and exactly similar to these are the furrows in which the Crab-Plover resorts to nest in; but whether it excavates them itself, or takes possession of the crab-holes for this purpose, I cannot say; but I believe, judging by their narrow diameter, that they originally were the work of crabs. They lie pretty close together and open generally towards the strand, and have a diameter of 5 or 6 inches, and are from 2 to 4 feet deep. It was not possible to make a minute examination of the holes, as when the sand was excavated they invariably fell in. The inner third of the passage appeared generally to bend to the right or left, and the cup-shaped nest-cavity was very small. In several (it was in the month of July) we found a half-grown young one. Before the entrance lay the fragments of a proportionately large, somewhat stumpy-shaped, dirty-white egg, with a transparent yellow appearance. One of the nests contained grass-roots and seaweeds, which probably, owing to the dampness of the nest, combined with the high temperature, underwent decomposition, and thus furnished the eggs with sufficient warmth for incubation, as is the case with the *Megapodes.*

"The young appear not to forsake the nest for a long time, though they can run right well. They seemed to be blinded by the daylight, chirped like young chickens, and ran as fast as possible towards the rocks and stones, so as to hide themselves in the shade."

Through the kindness of Mr. Howard Saunders, I have been able to examine the eggs sent home by Captain Butler, who states they were taken from holes in the sand in an island* in the Persian Gulf, his collector observing the birds leave the nests, and thus identifying them beyond doubt. The series consists of eight specimens, pure white, and resembling the eggs of Shearwaters in shape, but they are much broader at the large end; some are slightly pointed at the small end, while others, though much reduced at that part, have rounded ends. The texture is tolerably smooth; but the shell is pitted. Some of the series measure:—2·52 by 1·75, 2·36 by 1·79, 2·56 by 1·78, 2·47 by 1·75, and 2·52 by 1·78 inches. After incubation the shell would be naturally dirty white, as Von Heuglin describes it.

Layard sent an egg (now in the Calcutta Museum) to Blyth from Ceylon, purporting to be that of this species, and which was no doubt brought to him by natives. It is evidently the egg of the Stone-Plover (*Œdicnemus scolopax*), and is described by Mr. Hume as "warm drab-colour, pretty thickly blotched, streaked, and spotted with deep blackish brown." Its dimensions are 2 inches by 1·4.

* The same post has brought me the proof of this article and Nos. 2–5 'Stray Feathers,' 1879, with Mr. Hume's account of the nidification of this species in the above-mentioned locality. The name of the island is Montafie, situated about twenty miles east of Bushire. Mr. Nash, of the Telegraph Department, who found the eggs, says, "the bird burrows into the sand hills about four feet deep and in the shape of a bow; the passage runs about a foot below the surface of the ground, and the entrance is usually near or under tussocks of grass or low shrubs. The egg, which is solitary, is laid on the bare soil at the end of the hole, without any sign of a nest." I am glad to find that Mr. Hume notices the affinities of this species with the Shearwaters.

Order GAVIÆ*.

Bill and nostril varied. Wings lengthened, with 10 primaries. Tail even or forked. Legs short; tibia bare more or less above the knee; tarsi compressed laterally. Feet more or less fully webbed; hind toe very small (in one family only represented by a nail) and placed above the anterior ones.

Nidificating on the ground, as the last family, and the young likewise *autophagous*, or following the parent from the egg. Plumage thick and close. Of powerful flight.

Fam. LARIDÆ.

Bill straight; nostrils lateral and linear; gonys short and deep in some, long and less pronounced in others, the tip of the mandible hooked in one group. Wings long, 1st quill the longest; secondaries short. Tail variable in length, of 12 feathers, even or cuneate in some, forked in others. Feet webbed, the inner web incised in some; hind toe present.

Sternum with double shallow notches, rounded at the apices.

Subfam. STERNINÆ.

Bill straight, rather slender, the tips of both mandibles acute; the gonys long and slightly pronounced; nostrils linear and pervious. Primaries lengthened. Tail variable, in some emarginate, in others deeply forked. Legs and feet small, inner web more or less incised in most.

With a change of plumage in summer, acquired by a moult. Not of natatorial habit.

Genus HYDROCHELIDON.

Bill typically short, less compressed than in the next genus, the gonys short; nostrils widened. Wings long, exceeding the tail when closed, with the 1st quill considerably longer than the 2nd. Tail short, emarginate. Legs and feet small; webs very deeply scalloped, the inner joining the middle toe at its 1st joint; claws long and curved.

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* The relations of this order with the great Limicoline group which has just been dealt with do not seem to have been sufficiently recognized. The Gaviæ, as dwellers on the sea, are merely altered forms of shore-birds, outwardly modified for more enduring flight and greater powers of progression on the water. Their nidification is similar to that of the *Limicolæ*, their eggs are of the same character, and the young follow the parent from the nest; in every thing, in fact, but flight and note, the *Gulls* and the Plovers resemble one another in no small degree. A visit to the Zoological Gardens, where Oystercatchers and Gulls are kept in the same enclosure, will demonstrate the exact resemblance in form, deportment, gait, and *general* outward appearance that exists between these two genera.

HYDROCHELIDON HYBRIDA.

(THE BLACK-BELLIED MARSH-TERN.)

Sterna hybrida, Pall. Zoogr. Rosso-As. ii. p. 338 (1811).

Sterna leucopareia, Natt. in Temm. Man. d'Orn. p. 746 (1820).

Sterna javanica, Horsf. Trans. Linn. Soc. xiii. p. 198 (1820).

Hydrochelidon fluviatilis, Gould, P. Z. S. 1842, p. 140; id. B. of Austr. vii. pl. 31 (1848).

Viralva indica, Steph. in Shaw's Gen. Zool. xiii. p. 171 (1825).

Hydrochelidon indica (Steph.), Blyth, Cat. B. Mus. A. S. B. p. 290 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Jerdon, B. of Ind. iii. p. 837 (1864); Legge, Ibis, 1874, p. 32; Hume*, Nests and Eggs, iii. p. 648 (1875).

Hydrochelidon leucopareia (Natt.), Holdsw. P. Z. S. 1872, p. 480; Legge, J. A. S. (Ceylon Branch), 1874, p. 58.

Hydrochelidon hybrida (Pall.), Swinhoe, P. Z. S. 1871, p. 421; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1449 (1873); Salvadori, Uccelli di Born. p. 372 (1874); Legge, Ibis, 1875, p. 407; Saunders, P. Z. S. 1876, p. 640; Dresser, B. of Eur. pt. 57 & 58 (1877); Hume, Str. Feath. 1878, p. 49 (B. of Tenass.), et 1879, p. 115 (List of Ind. B.).

The Whiskered Tern, Common Marsh-Tern, Small Marsh-Tern, of authors. *Samar Saut*, Sumatra (Raffles); *Pater-lahut*, Java (Horsfield); *Kāda kuruvi*, Ceylonese Tamils. *Liniya*, Sinhalese; also *Mutheru Kirella*, lit. "Sea-Plover," Villagers in the interior.

Adult male and female (Ceylon). Length 9·3 to 10·8 inches; wing 8·1 to 9·3, reaching when closed to 1·8 beyond tail; tail 3·0 to 3·5; tarsus 0·8 to 0·9; middle toe 0·8, its claw (straight) 0·42; bill to gape 1·5 to 1·8, at front 1·05 to 1·2.

Breeding-plumage. Iris deep brown; bill arterial blood-red or dark lake-red, some with the culmen dusky; inside of mouth and gape bright red; legs and feet arterial blood-red, claws black. These are the normal tints of the soft parts in the breeding-plumage; but the tone of the colour of the bill and feet vary.

Female (Ceylon, April). Forehead, head, and nape black, passing from the bill to the lower anterior edge of the eye, and from the same position behind the eye to the nape; lower portion of lores, face, and ear-coverts white; the lower eyelid black: hind neck, back, scapulars, wing-coverts, upper tail-coverts, and tail dark blue-grey, the wing-coverts and tail slightly paler than the back; outer web of lateral tail-feathers white; inner webs of the primaries brownish grey, the basal portion white, running out in a point into the brownish, the outer webs and tips "frosted"† white when the feather is new; primary-shafts white; secondaries and tertials delicate grey, the former tipped with white; chin white, passing into faint grey on the throat, and gradually darkening on the fore neck and chest into the pure grey-black of the lower breast, abdomen, and flanks; rump and under tail-coverts white; axillaries and under wing white.

Male (Southern Europe). Darker on the back, and the black of the lower parts deeper than in several female examples from Ceylon. In my own collection there are no male specimens in perfect summer plumage.

Winter plumage (Ceylon). Bill (variable) blackish red, dull red, almost black in some; legs and feet likewise varying from dark reddish to dull lake.

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* I cannot, for want of space, continue to give more than the leading Indian references.

† The delicate "frosting" or "silvering" of the outer primary-webs in this family of birds speedily wears off, and exposes the dark grey ground-colour of the feather.

Forehead, anterior portion of the lores, face, throat, and entire under surface pure white; lores just in front of the eye striped with black; crown greyish, the feathers with central blackish stripes; occiput, nape, and behind the eye black, the feathers tipped with white; back, wings, and tail pale bluish grey, the latter tinged somewhat with brownish; hind neck just below the black of the nape whitish. The coloration of the head varies, some examples having the *crown* much more striated than others.

The change to summer plumage takes place by a moult, commencing in Ceylon at the end of February or beginning of March, the head and back changing first, then the dark feathers of the chest and underparts appearing among the white ones; the quills and tail-feathers are moulted in the spring, and apparently at an earlier date than the body-feathers.

Nestling in down. Buff: chin and chest white; forehead and a broad band across the fore neck black, connected by a stripe on each side of the chin; crown and hind neck marked with black, as also the lower back, rump, and wings; on each side of the white chest is a brownish patch joining the black of the throat: bill at front 0·3 inch.

In another specimen, from Galicia, the back is blackish brown, striped and mottled with reddish grey; head and hind neck grey, with less of the reddish tint; crown mottled with black, and down the hind neck a broad stripe of the same; behind the ears a patch of black; beneath greyish, tinged with brown on the throat. The quills are appearing in this specimen, but there is no sign of the scapulars, which generally accompany them. Bill to gape 0·95 inch.

The nestling plumage at first is characterized by the very dark rufous edgings of the upper-surface feathers, and is as follows:—Head blackish brown, striated obscurely with cinereous; ear-coverts concolorous with the head; back and scapulars blackish brown, the bases of the feathers grey and the tips rufous; lower back grey, also the tail and coverts; wing-coverts slate-grey, tipped here and there with mingled brown and rufous; tertials tipped with rufous; beneath white, encroaching on the brown of the hind neck. In course of time the rufous edgings change or fade to buff. In some specimens the tertials and scapulars are deeply indented along the margins with rufescent. This plumage is doffed during the early part of the winter, as late as December in Ceylon, and the blue-grey feathers of the upper surface assumed; the head, however, remains much darker than in the adult in winter; the least wing-coverts are dark grey, and these dark feathers are again acquired in the second autumn, being then the only sign of adolescence.

Obs. No difference of character is perceptible in this bird from any country within its widely-extended habitat. Examples from India, China, Europe, and Africa in size fall within my limits for Ceylon:—"Amoy" (♂), wing 9·0 inches, bill to gape 1·55 (date 28th of August, still in summer plumage); "China" (♀), wing 8·7; "Malta" (♂), wing 8·7, bill to gape 1·7; "South Africa" (Mus. Saunders), wing 8·7. The summer plumage of male Chinese specimens is darker than that of females.

Distribution.—This Marsh-Tern is the most abundant of its family in Ceylon, being found throughout the entire sea-board, and frequenting likewise marshy places, paddy-fields, tanks, and inland waters in both the cultivated and jungly districts of the interior as far in as the base of the mountains, although its numbers in the south and west of the island gradually decrease away from the maritime districts. In the north of the island this rule, however, does not apply so strictly; for Marsh-Terns are found plentifully at the large tanks of Topare, Minery, Padawiya, Anaradhapura, &c., and at Kanthelai it is abundant. It is found in greatest numbers in large paddy-fields and marshes close to the sea. Although a resident in the island to a considerable extent, large numbers leave for more northern latitudes in April and return in September. I have met with it in June and July about the leways of Hambantota and Kirinde in perfect winter plumage, both in adult and adolescent stages, and at Kanthelai and Topare tanks have seen it in summer and winter plumage in August. In the west and south of the island it is found in greater numbers about paddy-fields than on the open coast; but in the north, where the sea-shore is intersected with lakes, backwaters, and shallow islets, it is very abundant on the coast.

This species is very common throughout India, frequenting marshes, rivers, and all inland waters; it extends northwards into Turkestan (where it breeds, according to Severtzoff), and also into Mongolia as far north as the Hoang-ho valley; eastwards it is found in Tenasserim, and probably occurs in Siam and Cochin China, for Swinhoe procured it in Formosa, beyond which it has occurred in the Philippines at Manilla. Southwards in this direction it occurs in Borneo, Sumatra, Java, Celebes, the Togian islands, and is spread most likely more or less throughout Malasia, for it is found in Australia, on which continent Gould procured it in New

South Wales on the Namoi and Mokai rivers, and on the Swan river in Western Australia, while in the interior it was observed by Sturt. Mr. Ramsay records it further from Cape York, Rockingham Bay, Wide Bay, Victoria, and South Australia.

Returning now from this sketch of its distribution in a south-easterly direction to the consideration of its locale in India, I find that it is chiefly a cool-weather visitant to Southern and Central India. In the Deccan Mr. Davidson observed a few individuals only in the rainy season; and further north, in Guzerat, it is not found, according to Captain Butler, in the hot weather; on the eastern side of the peninsula, in the same latitude, it is a cold-weather bird about Calcutta and in Furreedpore; and though I find it recorded from Manbhum, Orissa, and Raipur, and spoken of by Mr. Ball as common on the river Koel, no mention is made of its breeding in those districts. In the North-west Provinces, Oudh, parts of the Punjaub, and in Cashmere it breeds not uncommonly, the Woolar Lake in the latter province being a great nesting-resort of the species. It is common in Sindh and at the Sambhur Lake, and in the former Mr. Hume was informed that it bred. Eastward of the Bay it does not seem to be generally diffused, as it is only recorded from the district between the Salween and the Sittang rivers in Tenasserim. It appears to avoid the highlands of Central Asia, but not the lower-lying Mongolian region, where Prjevalsky found it breeding abundantly on the Tsaidemin-nor lake. Although found as far north as these regions, it does not range into Siberia, and Schrenck did not observe it on the Amoor. In Palestine it is abundant, according to Canon Tristram, on the Sea of Galilee, and retires in the breeding-season to the marshes of Huleh to nest. In the spring it is found on the shores of the Mediterranean and on the islands, being recorded from Malta as late as the month of May. It inhabits the southern and central portions of Europe as far north as Germany in the summer, breeding in Greece, in Southern Russia, on the Caspian and the Volga, in Hungary (presumably, having been obtained there in June), and on the marismas of Southern Spain; it arrives on passage north in the Gibraltar district about the middle of April (*Irby*), and nests in Andalucia in May. It is an accidental visitor to North Germany and the north of France, and has occasionally been found in England. It does not occur in the Baltic.

It does not extend to America; but there is a specimen in the British Museum from Barbadoes, presented by Sir Robert Schomburgk, whither it had evidently wandered as a very isolated straggler. In Africa it is abundant in winter in parts of Morocco, in Egypt, and in Nubia, and ascends the Nile into Abyssinia. It breeds in great numbers, according to Favier, at Ras Dowra, in Morocco. It is found also in Egypt and Nubia throughout the year; and Von Heuglin is of opinion that it breeds in the country. We have no record of its wandering past the equator on the east coast; but it is found on the western side of the continent; and as it is very abundant in Damara Land in winter, its course of migration is evidently by way of the west coast.

Habits.—This Marsh-Tern, which is the finest of its genus, is a bird of fearless disposition and bouyant and graceful, though not swift, flight, and frequents fresh waters more than the sea-coast, although it is partial to brackish lagoons, shallow salt lakes, and estuaries of large rivers. In Ceylon it is the only Tern seen in the paddy-fields; and as it is of a gregarious nature, large flocks collect there in the autumn while the land is being ploughed, and sometimes follow the natives while they are working, picking up water-beetles and other aquatic insects which become exposed by the upturning of the slushy soil. They are to be seen throughout the season careering round and round the Colombo Lake, and flying most perseveringly to and fro, traversing many miles in their course without ever dipping into the water; and when tired of conducting a fruitless search, will fly off again or settle perhaps on the telegraph-wires crossing the lake or the Lotus-pond, and rest there in company with Swallows, occasionally starting off on a fresh cruise in pursuit of the gnats and insects which infest the latter spot. They frequently perch on fences and stakes in the paddy-fields. Their flight is generally low, about 20 feet from the water; and when they descend upon their prey they do not pounce, but, dashing down, they expand their wings, and "dip up" the fish which they have espied from above. At Hambantota I have seen them hovering for an instant over the eggs of the Little Tern, and was inclined to believe that they had eggs themselves; but the individuals I saw so doing were in winter plumage. They do not rest upon rocks, but are often to be seen in little troops reposing on the sandy beach. At nights they resort to beds of reeds or bushes in swamps to roost; and when flying off to their feeding-grounds in the morning they proceed in closely-packed little troops straight-on-end; and if crossing an arm of the sea or

estuary, they take their course close above the surface of the water, not deviating from the direction they have resolved to travel in. Their note is a shrill and not unpleasant little scream, sometimes varied by a hoarser cry, and which they utter very frequently when congregated in some spot supplying them with an abundance of food. They consume very small fish and aquatic insects, as well as worms and various larvæ, and never by any chance alight of their own accord on water.

Nidification.—Though I was not fortunate enough to find the eggs of this Tern, I am under the impression that it breeds to a limited extent in Ceylon. I met with a flock one evening at Topare tank in the month of July, which flew in from the surrounding country and settled in the middle of the morass; and though I was near enough to see that some were in winter plumage as they passed, I think others were in breeding-livery. At Kanthelai I have shot them in the latter plumage in August. In India they breed in June and July, resorting to large jheels and swamps, and building loose nests of rush-stems and reeds on floating vegetation. The late Mr. A. Anderson, who discovered a breeding-colony at Fyzabad (Oudh), situated in a swamp, which is described as a tangled mass of weeds and aquatic plants, observed the birds carrying long, wire-like reeds some 2 feet in length. "The circumference," he writes, "of some of the nests I measured ranged between $3\frac{1}{2}$ and 4 feet, and they were about 4 inches thick. They were composed entirely of aquatic plants, and so interwoven with the growing creepers that it was impossible to remove them without cutting at the foundation of the structure." The eggs were two and three in number; in another instance, recorded by Mr. Hume, nests were found containing only one egg. This author gives the average size of forty-eight Indian specimens as 1·51 by 1·09 inch. A fine series which I have examined in Mr. Dresser's collection are oval in shape, some rather stumpy at the small end, others compressed, having an ovate pyriform appearance. The shell is smooth, without any gloss, and the ground-colour is mostly dull olivaceous or pale olive-grey; but some specimens are brownish stone. The markings consist of large blotches of brownish black or very deep sepia, or small spots of the same, pretty thickly diffused over the egg; some are closely blotched with smeary markings of a lighter hue, and in others these take a straggly form. In one specimen of the series before me, in the collection of Mr. Dresser, the markings are collected on the obtuse end; the underlying coloration is inky grey or pale purplish grey. The dimensions of several eggs are 1·57 by 1·13, 1·53 by 1·12, 1·57 by 1·16, and 1·55 by 1·33 inch.

HYDROCHELIDON LEUCOPTERA.

(THE WHITE-WINGED MARSH-TERN.)

Sterna leucoptera, Meisner & Schinz, Vög. Schweiz, p. 264 (1815).

Hydrochelidon leucoptera (Meis. & Sch.), Buller, B. of New Zealand; Dresser, B. of Eur. pt. 45 (1875); Saunders, P. Z. S. 1875, p. 641; David & Oust. Ois. de la Chine, p. 524 (1877); Hume, Str. Feath. 1879, p. 115 (List B. of Ind.).

Sterna nigra, Linn. *apud* Holdsw. P. Z. S. 1872, p. 481 (first record from Ceylon); Legge, J. A. S. (Ceylon Br.), 1874, p. 58; id. Str. Feath. 1875, p. 376.

Hydrochelidon nigra, Linn. *apud* Swinhoe, P. Z. S. 1871, p. 421; Heuglin, Orn. N.Ost-Afr. ii. p. 1447 (1873).

Hirondelle de mer leucoptère, French.

White-winged Black Tern.

Adult male and female (China). Wing 8·0 to 8·3 inches; tail 2·8 to 3·0; tarsus 0·7; middle toe 0·7, its claw 0·3 to 0·38; bill to gape 1·21 to 1·38. (Europe) wing 7·9 to 8·4; tail 3·0 to 3·1; tarsus 0·8; bill to gape 1·3 to 1·55. (Ceylon) ♀, wing 8·0; bill at front 0·97.

Iris dark brown; bill reddish black; inside of mouth yellowish red; legs and feet orange-red, claws black.

Adult (May, Amoy). Head, neck, and throat deep black, paling to brown-black on the breast and abdomen, and to black pervaded with grey on the interscapulary region: back, rump and scapulars, upper tail-coverts and tail white, the latter washed with grey, most darkly on the centre feathers: the lateral pair pure white; least wing-coverts and along the edge of the wing white, passing into dark grey on the greater coverts and tertials; primary-coverts greyish white; secondaries grey, darkening into brownish on the tips of the innermost feathers; first three primaries black, washed with grey on the outer webs, and the inner edges whitish; the remainder frosty greyish white on the outer webs and brownish on the inner, the shafts white; under tail-coverts and under surface of tail white; axillaries greyish black; under wing-coverts black, but the primary series whitish; edge of the wing beneath white.

Winter plumage (Spain). Forehead and crown white; nape and occiput dark grey, as also the back and scapulars; the rump and upper tail-coverts pale greyish, almost white; throat, fore neck, under tail-coverts, and under wing white; breast greyish; in front of the eye a black spot.

The change to summer plumage takes place by a moult in May; the head and throat become interspersed with black feathers, as also the chest, breast, and under wing; and in June the full plumage is donned. The example shot by Mr. Holdsworth is in change as here described. In some specimens the blackish of the lower back ends abruptly against the white of the upper tail-coverts, in others the colours blend. The hue of the wing-coverts varies, some birds being whiter than others.

Nestling in down (Volga, mus. Dresser). Pale yellowish or earthy brown; the crown patched with black, a stripe of the same down the nape, and a spot on each side of it; down the centre of the back a series of black patches branching out at the lower part of the neck and again on the wings; ear-coverts and ears white; down of the throat tipped black.

First autumn plumage. Tarsi and feet reddish brown; bill blackish. Crown, occiput, and nape brown; the white of the sides of the nape *encroaching on the dark colour of the nape just behind the ear*: interscapulary region and scapulars earth-brown, the feathers tipped with fulvous; lower back brownish slaty; rump white; tail and the coverts slate-grey, the former tinged with brown and tipped with white; wing-coverts slate-grey, tipped with fulvous and brown; lesser coverts dark slate-grey, edged with white; primaries blackish grey, the outer webs "frosted": beneath white, passing round the hind neck.

Second year ♀ (July, Hambantota). Length 9·5 inches; wing 7·85; tail 2·85; tarsus 0·75; middle toe 0·7.

Iris brown; bill black with a reddish tinge; legs and feet vinous brown: webs brown.

Lores and forehead white; a black spot in front of eye; crown, occiput, and nape blackish brown, some of the feathers faintly edged with white; ear-coverts black, continuous with the black of the crown, behind them the white of the neck encroaches on the dark colour; hind neck white, feathers at the lower part tipped with blackish brown; back and wings dusky slate-grey; upper tail-coverts paler; tail tinged with brown, the lateral feathers white, except at the tip; least wing-coverts dark brown; the median *very pale grey*; the greater and the secondaries brownish grey, inner webs of the primaries blackish grey. This individual, though it presents no appearance of a change to summer plumage, is evidently a full year old, although it is hard to say in what region or at what time of the year it was bred. An example, apparently of the same age, from Russia is acquiring the breeding-plumage.

Obs. This Tern can be distinguished in the immature stages from the last species by its smaller size (wing 7·8 inches against 8·5 in the quite young bird of *H. hybrida*), its slenderer bill, smaller legs and feet, and by the peculiar white patch or "*indentation*" *behind the ear-coverts.* From the young of the Black Tern it differs in the longer feet and toes and the paler upper tail-coverts. This latter Marsh-Tern (*H. nigra*, Linn.) differs from the subject of the present article in having the back and underparts in summer plumage dark sooty slate-colour, the head and hind neck only being black; the wing-coverts are slate-coloured, like the back, and the under wing greyish white instead of black. The feet and legs are smaller than those of *H. leucoptera.* Examples in my collection measure—wing 8·5 inches; bill at front 1·05 to 1·15.

Distribution.—This handsome Marsh-Tern has, singularly enough, proved itself a more frequent straggler to Ceylon than to India. It was added to the avifauna of the island by Mr. Holdsworth, who had the good fortune to meet with a pair in May 1866, flying about a small tank six miles from Aripu; one of these he procured, the specimen being now in the Colombo Museum. In October 1874 I saw an adult still in summer plumage in Koddiyar (Kottiar) Bay, near Trincomalie; and in July of the previous year I obtained a small immature Marsh-Tern at Hambantota, which I could not identify at the time, but which, on comparison with specimens in Mr. Howard Saunders's fine collection, turns out to be the young of this species.

In the 'Ibis,' 1870, p. 436, Mr. Hume added it to the Indian list, publishing a notice of a specimen shot in full plumage at Tipperah, in East Bengal, by Mr. V. Irwin; since that date, however, it does not appear to have occurred within Indian limits. That it should not occur more frequently in the Indo-tropical region is noteworthy, as it is diffused right across the continent of Asia (breeding in Turkestan) to Mongolia and China, where it is common, and southward of which it extends to the Malay archipelago, having been procured in Borneo and Celebes, and beyond which region again it must occasionally stray down the Australian coast, as Mr. Buller records an instance of a pair having been shot in the Province of Nelson on the Waihopai river in 1868; he also states that "it has been found in Australia of late." In China Père David found it common on the sea-coast and about inland waters, and met with it in Mongolia in numerous flocks on passage in the month of August. Prjevalsky found it breeding in abundance in the Lake-Hanka basin and at Lake Tsaidemin-nor, and noticed stragglers in Ala-shan. It must also breed in China, as there are specimens in full breeding-plumage in Swinhoe's collection. Northwards it has been procured in Kamtchatka; and on the Amoor Schrenck obtained it in July 1855. It ranges as far north as Southern Siberia, Pallas having met with it on the Ob. It is more numerous in South-eastern Europe than in any other part of the world, inhabiting the shores of the Caspian Sea and the river Volga in great abundance. In Asia Minor it has not been met with; but Canon Tristram saw it in Palestine. It occurs in Cyprus and in the Epirus, and in summer is found in Hungary, breeding there as well as in Southern Germany. It strays into Northern Europe during the summer in small numbers, occurring rarely in Denmark, and having once been procured in Sweden. It is very rare in England, having been now and then procured on the east coast in summer, and on two occasions has strayed as far west as Ireland. In Northern France it is rare, but in the south it is common. In Italy, Sicily, Sardinia, and Malta it is seen in the spring; and in the Balearic Isles it is stated to breed. Mr. Saunders met with it rarely in Southern Spain, but found it common on the east coast at Valencia. It is not recorded from Morocco, or from anywhere except Gambia on the west coast of Africa; but it is not uncommon in South Africa, being recorded as such on freshwater lakes in Damara Land by Mr. Andersson, and about lagoons and marshes by Messrs. Buckley and Ayres in December and November. Returning to North Africa, we have Loche finding it breeding in Algeria, and Von Heuglin stating that it

nests in the delta of the Nile, and southwards along this river to Wady-Halfa. It has been obtained at Kordofan and on the Red Sea, and is a straggler to the Blue and White Nile.

It has once occurred in America at Wisconsin.

Habits.—Like the last species, this Marsh-Tern is generally met with about inland waters, about which it flies with a rapid, graceful, and buoyant flight, and feeds on insects, water-beetles, small fish, larvæ, and worms. It consorts in flocks sometimes of considerable number, and associates with the Marsh-Tern, which it excels, however, in the swiftness of its flight. The adult mentioned above passed my boat in Koddiyar Bay at great speed, the black under wing-coverts and white shoulders being very noticeable. It is said to perch on stakes and elevated objects, like the common Marsh-Tern. Von Heuglin observes that they are courageous birds, and do not ordinarily display much shyness; he found them feeding on flies, cockroaches, and other insects, and states that they are usually very fat. Naumann has observed them picking insects off the ears of grain.

Nidification.—This species breeds in marshes, building a nest of reeds and rushes on floating vegetation, and lays in May and June. Its eggs are usually three in number, but sometimes four. A series which I have had the pleasure of examining in Mr. Saunders's collection vary considerably in ground-colour, being buff, brownish buff, pale buff stone-, and pale stone-colour, with a slight olivaceous tint, and are somewhat pointed at the small end for Tern's eggs; they are very boldly blotched and clouded, some at the large end and some on the middle of the shell, with deep sepia or black-brown, and there are numerous smaller markings of the same, under which are the usual light blots of grey of different shades. Examples measure—1·34 by 1·0, 1·35 by 0·99, 1·37 by 1·01 inch.

Genus STERNA.

Bill varied as regards stoutness; typically long and straight, with the gonys straight and lengthened; in some stouter and slightly curved throughout. Tail much forked, the lateral feathers lengthened in the breeding-season. Feet generally more fully webbed than in *Hydrochelidon.*

Head changing to black in the summer.

STERNA SEENA.

(THE INDIAN RIVER-TERN.)

Sterna seena, Sykes, P. Z. S. 1834, p. 171; Saunders, P. Z. S. 1876, p. 645; Hume, Nests and Eggs, iii. p. 650 (1875); id. Str. Feath. 1878, p. 492 (B. of Tenass.), et 1879, p. 116 (List of Ind. B.).

Sterna aurantia, Gray & Hardw. Ill. Ind. Zool. i. pl. 69. fig. 2 (1832); Hume, Str. Feath. 1873, p. 281.

Sterna brevirostris, Gray & Hardw. *t. c.* fig. 1 (1832).

Seena aurantia (Hardw.), Blyth, Cat. B. Mus. A. S. B. p. 291 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271; Jerdon, B. of Ind. iii. p. 838 (1864); Holdsw. P. Z. S. 1872, p. 480.

The Large River-Tern, Jerdon; *Sykes's Tern* of some.

Adult female (Tenasserim). Length 16·75 inches; wing 10·9; tail 7·75; tarsus 0·85; bill to gape 2·38, at front 1·55.

Male (Godaveri). Wing 11·0 inches; tail 6·9, depth of fork 4·8; tarsus 0·8; bill at front 1·6.—"India," *sex*? Wing 11·0; tail 6·8; tarsus 0·85; middle toe and claw 0·75; bill to gape 2·5.

The bill is stout and curved throughout in this species, resembling that of the Caspian Tern; lateral tail-feathers highly attenuated in the breeding-season.

Breeding-plumage. Iris brown; bill fine orange; legs and feet bright orange-red.

Female (Tenasserim). Head and nape intense black, with a greenish lustre, including the entire forehead and lores to the gape, and thence under the eye to above the ear-coverts; beneath the eye a white spot; hind neck, back, scapulars, wing-coverts, and tertials dark slate, paling on the rump and upper tail-coverts and central tail-feathers into bluish slate; three lateral pair of feathers white, tinged with grey; secondaries slate-grey; primaries grey on the inner webs, and "frosted" white on the outer, the coverts the same; chin round the gape and ear-coverts white, darkening imperceptibly on the fore neck, entire under surface, axillaries, and under wing into delicate grey, most pronounced on the lower breast; under tail-coverts white. Some examples are paler above than the one here noticed.

Winter plumage. Bill yellow, "dusky brown at the tip for half an inch" (*Butler*); legs and feet not so bright as in summer.

Forehead whitish, passing into grey on the head and occiput; round the eye a dark border, most prominent in front; "ear-coverts dusky blackish" (*Hume*). The black head is said by Mr. Hume to be worn until December; and as the bird breeds in March, the winter plumage must be doffed very shortly after it is assumed. In a specimen before me changing to breeding-dress, the new black feathers of the head are intermingled with those of winter, which are very plainly *dark* grey.

Young. Although this bird is so common in India, I have been unable to detect a specimen of the nestling in down in any collection in England.

The *immature bird* is figured by Hardwicke (*l. c.*), from whose plate I take the following description:—

Bill yellow, tipped with black; iris dark brown; legs and feet yellow.

Head fulvous brown, with blackish striæ; ear-coverts and beneath and in front of the eye blackish; above slate-grey, the feathers of the hind neck and back tipped with blackish; the wing-coverts, scapulars, and tertials tipped and edged with buff, bordered internally with blackish; upper tail-coverts edged with dark grey.

Captain Beavan (Ibis, 1868, p. 403) says that the edgings to the feathers of the upper part are dark and wavy.

Obs. There seems to be little variation in the size of this Tern. Mr. Cripps furnishes the following data concerning a male shot in Furreedpore:—"Length 14·75 inches; expanse 31·0; wing 10·75; tail from vent 4·66; tarsus 0·83; bill from gape 2·46, at front 1·62: weight 5·25 oz. Irides dark brown; bill bright yellow; legs vermilion; mouth inside yellow." The peculiarly coloured legs will always serve to identify this species at once.

Distribution.—This River-Tern is said by Layard to be common in Ceylon. It may be, perhaps, a straggler to the island; but the statement that it is common is most certainly erroneous, and it is quite evident from Layard's words that he has been mistaken in his identification of the species. He says (*l. c.*) :—"*Th. bengalensis* and *S. aurantia* pass in vast flights westward along the coral reefs on the north of Ceylon during the months of May and June." The latter is entirely a River-Tern, never frequenting the open coast; and the former, with which our bird is coupled, is a Sea-Tern, exclusively confined to the coast, and associating only with its larger relative, the Crested Sea-Tern, and another large species, the Gull-billed Tern. I was ever on the look-out for this species; and though I shot very many unfortunate examples of the bird called by Layard *Thalasseus bengalensis* (which is about the same size, and has a yellow-looking bill when on the wing), in the hopes of procuring a River-Tern, I did not succeed in getting one the whole time I was on the island, nor did I meet with any one who had ever shot it. As Layard informs me that all his birds were identified by Blyth, it follows, in all probability, that he procured it, and I therefore do not relegate it to the category of those species which have only been seen and not satisfactorily identified. It may occur as a straggler; but there are no favourable situations for it in the island, as it chiefly affects large rivers with sandy banks, and is a stationary species.

In India it is common on most of the large streams, and is also found about large tanks, whither it strays from its more accustomed haunts, the rivers of the peninsula. I am not aware that it is very common in Southern India; but the Rev. Dr. Fairbank records it from the rivers in the Deccan, and it is plentiful on the Mahanadi, Godaveri, and Koel rivers; and the other districts from which Mr. Ball notes it are the Rajmehal hills, Bardwan, Lohardugga, Orissa, Raipur, and Sambalpur. Its home, *par excellence*, is the Ganges and its many sandy-bedded affluents; and it follows the Hooghly down to its mouth. On the rivers of Furreedpore it is common and resident, breeding on the Brahmapootra; but in the streams of Cachar, further east, it is rare. In Lower Pegu it is abundant, frequenting the whole course of the Irrawaddy throughout the year. It is found on the Sittang, Salween, and other streams as far south as Moulmein, beyond which, in Tenasserim, it does not seem to have been observed. Turning westward, we find Mr. Hume recording it as fairly abundant in Sindh on the Jhelum, Chenab, and Indus, right down to the sea, being even noticed in Kurrachee harbour, but it was not seen outside at sea; in all the large "broads" of the province of Sindh it abounds, says this author.

Habits.—As has been already noticed, this fine Tern is a dweller on rivers, and is said to hunt singly or in pairs, or in very small parties, following the course of the sacred Ganges and other mighty kindred streams, resting on their glistening sand banks when fatigued with its labours, and rearing its young in these glaring spots beneath the rays of a tropical sun. Its companion seems to be the remarkable Indian Skimmer (*Rhynchops albicollis*), which has never yet favoured Ceylon with its presence, but which spends its existence on the broad rivers of the mainland. After the manner of the inland group of Marsh-Terns, the present species, however, frequents also jheels and tanks, and must, in these spots, find an abundance of similar food to that partaken of by the latter-mentioned birds. Its flight is swift and well sustained, and its note is a shrill cry.

Nidification.—As early as the middle of March this species begins to lay on the Jumna and other rivers in the north of India; but on the Indus they do not, says Mr. Hume, lay until the second week in April. They nidificate on the churs or sand banks, and make no nest further than a small depression in the sand; and it would appear that occasionally they lay their eggs indiscriminately with those of other species, as Mr. Brooks informed Jerdon of such an instance having occurred on a sand bank in the Ganges. The nests are usually pretty close together, and are vigorously defended by the parent birds. Respecting their boldness, Mr. Hume writes:—"The vigorous manner in which these River-Terns attack and chase away Crows, Kites, and similar would-be robbers from the immediate neighbourhood of their nests is very noticeable. To me they seemed to

show more solicitude for their eggs than any of the other species breeding near them. It is impossible to doubt when they have eggs anywhere near; the way they flash backwards and forwards, and wheel round and round overhead, incessantly repeating their shrill plaintive cry, at once reveals the existence of the treasures they are so anxious to preserve." Regarding the incubation of the eggs, he writes that at the season when they lay "the bare white glittering sands on which the eggs are deposited are often at noon-tide too hot to touch; and accordingly, during the daytime, the birds seem to trust to the heat of the sun to hatch the eggs, and are rarely to be found on their nests; they pass the time wheeling round and round above, or snoozing beside them. By night every egg is covered by one or other of the parent birds; and when it is dark they sit so close that it is easy to catch them with a common butterfly-net." The eggs are usually three in number; and a series that I have examined in the collection of Mr. Howard Saunders are pale olivaceous stone-colour, some brown, others greener in tint; they vary in shape from long to broad ovals. The markings are moderately-sized blots and spots of dark red, purplish red, and red-brown, pretty evenly distributed over the surface of the shell, and mingled with blotches or small clouds of bluish grey and purple-grey underlying the dark markings. Dimensions of some examples in Mr. Saunders's collection are 1·67 by 1·17, 1·84 by 1·25, and 1·48 by 1·17 inch, showing that considerable variation in size exists.

STERNA MELANOGASTRA.

(THE BLACK-BELLIED RIVER-TERN.)

Sterna melanogaster, Temm. Pl. Col. v. pl. 434 (1838); Gould, B. of Asia, pt. 19 (1867); Holdsw. P. Z. S. 1872, p. 481; Legge, Ibis, 1875, p. 407.

Sterna javanica, Horsf. *apud* Blyth, Cat. B. Mus. A. S. B. p. 292 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271; Jerdon, B. of Ind. iii. p. 840 (1865); Hume, Str. Feath. 1873, p. 282; id. Nests and Eggs, iii. p. 652 (1875).

Sterna melanogastra, Temm., Saunders, P. Z. S. 1876, p. 645; Hume, Str. Feath. 1878, p. 492 (B. of Tenass.), et 1879, p. 116 (List Ind. Birds).

Adult. (India) Wing 8·5 inches; tail 5·8, outer feathers 3·4 longer than middle pair; tarsus 0·42; middle toe 0·5; bill at front 1·45. (Futtehgurh) Wing 8·2; tail 5·8; tarsus 0·6; middle toe 0·5; bill at front 1·5; length 12 inches. (*Jerdon.*)

Summer plumage. Iris brown; bill orange-yellow; legs and feet pale clear yellow.

(Futtehgurh). Forehead, head, and nape black; lores almost all white, the black colour only occupying the space just in front of the eye; neck, back, and wings bluish grey; upper tail-coverts and tail paler bluish grey; outer web of the 1st primary and tips of the remainder dark grey, the outer webs of the remainder silvery greyish white; shafts white; face and throat white, passing into delicate grey on the chest, and thence gradually on the breast into the uniform black of the *belly, vent, and under tail-coverts*; flanks and axillaries pale blue-grey; under wing white.

Winter plumage (India). Bill yellow, tip blackish; legs and feet yellow.

Back and wings grey, paler than in summer; lores and forehead white; head and nape grey, striated with black, which behind the eyes becomes confluent and forms a patch.

The winter plumage is assumed, according to Mr. Hume, as late as the middle of December, as in the case of its larger relative, *S. seena*, and is doffed again in February and March.

I have been unable to examine a nestling of this Tern; nor am I acquainted with the immature plumage, which is, however, probably tipped above, as in other species, with brown and fulvous.

In both this species and *S. seena* the bird of the second year is probably characterized by the usual dark feathers above the ulna.

Obs. Data as to size and weight are given by Mr. Cripps, in his 'List of the Birds of Furreedpore,' as follows:—"*Male.* Length 12·7 inches; expanse 25·0; wing 8·75; tail from vent 5·5; tarsus 0·58; weight 2·5 oz. Iris brown; bill bright orange-yellow; legs dark orange-yellow."

Distribution.—This handsome little Tern, which is a very rare species, was never procured by me in Ceylon; and though I identified, in my paper "On the Birds of the South-eastern Subdivision of Ceylon" ('Ibis,' 1875), a species *seen* there with it, I am now pretty sure that I was mistaken, and that many, if not all, the dark-bellied birds I saw in the hot season were nothing but the Marsh-Tern, and those I met with in winter plumage and thought to be it were the Asiatic Little Tern, *S. sinensis*. Mr. Holdsworth writes that he has frequently seen it near Aripu, and occasionally at Colombo; but he informs me that he never procured it, and I am under the impression that many examples taken by him for it were the Marsh-Tern in summer plumage. Layard's remark concerning it is:—"*S. javanica* is common even on the lakes at Anaradhapura." This evidently applies to the Marsh-Tern, for though the present species is found straying about jheels and tanks in India, it is when they are in proximity to the large sandy-shored rivers on which it passes the most of its time: there are, however, none such in Ceylon; and I am convinced that such a small island, devoid of these rivers, is wholly unsuited to the habits of both this and the Larger River-Tern; but at the same time I am ready to admit that both *may* be occasional visitants to the island.

In India it frequents, like the last species, the large rivers, being found, according to Jerdon, on every one of them. In the Deccan, Messrs. Davidson and Wenden say that it is common on all the rivers, likewise breeding on them; and the same remark as to its general distribution in Chota Nagpur is made by Mr. Ball, who, in his valuable list of the Godaveri-Ganges region, notes it from Bardwan, Manbhum, Lohardugga, Sirguja, Sambalpur, and Orissa, while Mr. Hume has it from Raipur. On the Hooghly, Ganges, Jumna, and Brahmapootra it is resident and a common species; and on the streams of Furreedpore it is likewise abundant all the year round. It extends eastward into Burmah, being very numerous on the Irrawaddy, and breeding there in March. Southward, in Tenasserim, it is common on all the inland creeks and larger rivers of the northern half of the province. Captain Ramsay procured it at Tonghoo, and Mr. Davison on the Salween and Sittang rivers, and at Kedai-Keglay, Thatone, and Wimpong; but it is not recorded from anywhere south of Moulmein. Returning now to the north-west of India, we find Mr. Adam recording it from the Sambhur Lake in October, where he, however, only procured a single pair, so that it would seem to be a straggler to that district; it does not seem to have been noticed in Guzerat, but on the rivers of Sindh and the Punjab Mr. Hume states that he found it excessively common. It has occurred as a straggler during a tempest at the island of Réunion.

Habits.—This elegant little Tern is entirely a freshwater species, seldom frequenting any other localities but rivers, except where there are marshes and jheels in riverine districts, when it is found hunting about them, after the manner of Marsh-Terns. Its flight is said to be swift; and if my identifications of it on the wing in Ceylon have been correct, I have noticed that it is something like that of the small group of Terns, *S. minuta*, &c., to be noticed presently—that is, performed with quick regular beatings of the wings, adroitly turning or swerving from side to side as occasion offers. Its note, which it utters when flying round and round over its nest, is likened by Captain Burgess to the chirp of a Sparrow. It is a bird of bold disposition; for I observe that Mr. Hume found them resuming their positions near their eggs after having been disturbed, when he had only retreated some 30 or 40 yards from them. Its food consists of small fish, larvæ, and aquatic insects.

Nidification.—Like the last species, this little Tern breeds very early in the season, laying as early as the second week in March, at which time its eggs have been taken on the Jumna and the Irrawaddy. By the beginning of May all eggs are hatched off. No nest is made; but the eggs are merely deposited in shallow circular depressions in the sand, sometimes so near the water that they are damp. The eggs are usually three in number, never more; but sometimes two only are laid. They are glossless, and, according to Mr. Hume, are of various shades of cream- and buff-colour, marked usually with small specks, streaks, and spots, not thickly set, and occasionally with a few large blotches of reddish or purplish brown, under which are hazy spots, clouds, and streaks of pale purple. The average size of eleven eggs is given as 1·3 by 0·99 inch. Two specimens which I have examined, in the collection of Mr. Howard Saunders, are pale stone-grey and delicate greyish white in ground-colour: one is marked with purplish-brown blotches overlying handsome clouds of purplish grey, beneath which, again, are faint blots of bluish grey; the other is coloured with small straggly markings and specks of red-brown over small blots of purplish grey. They measure 1·18 by 0·91 and 1·27 by 0·96 inch.

STERNA CASPIA.

(THE CASPIAN TERN.)

Sterna caspia, Pall. Nov. Comm. Petrop. xiv. p. 582 (1769); Hume, Str. Feath. 1873, p. 280; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1434 (1873); Legge, Ibis, 1874, p. 3; Saunders, P. Z. S. 1876, p. 656; Dresser, B. of Eur. pt. 59, 60 (1877); Hume, Str. Feath. 1879, p. 115 (List of Ind. B.).

Sterna tschegrava, Lepechin, Nov. Comm. Petrop. xiv. p. 500 (1769).

Sylochelidon caspia (Pall.), Blyth, Cat. B. Mus. A. S. B. p. 290 (1849); Kelaart, Prodromus, Cat. p. 137 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Jerdon, B. of Ind. iii. p. 835; Holdsw. P. Z. S. 1872, p. 480; Legge, Ibis, 1875, p. 407; David & Oust. Ois. de la Chine, p. 522 (1877).

Sylochelidon strenuus, Gould, P. Z. S. 1846, p. 21; id. B. of Austr. vii. pl. 22 (1848).

The Largest Tern, Jerdon; *Raub-Meerschwalbe*, German; *Reus Zeezwaluw*, Dutch. *Keykra*, Sindh (Hume).

Liniya, Sinhalese.

Adult male and female (Ceylon). Length 19·2 to 20·5 inches; wing 15·3 to 15·75, reaching to 2·5 beyond the tail; tail 5·0 to 5·8; tarsus 1·7 to 2·0; middle toe and claw 1·6 to 1·8; bill to gape 3·6 to 3·75; weight $1\frac{1}{2}$ lb. The tail is not deeply forked in this species, the outer tail-feathers not much exceeding the adjacent pair.

Summer plumage. Iris dark brown; bill coral-red, dark brown close to the tip in some; the extreme tip yellowish; inside of the mouth orange-red; legs and feet black. The bill in this species is very stout and slightly curved.

Forehead and most of lores, crown, and nape glossy black, passing underneath the eye and *above* the ear-coverts; hind neck and all the lower plumage, with the axillaries and under wing, pure white; back and wings very pale grey, paling almost to white on the upper tail-coverts and tail; primaries blackish grey, the outer webs entirely "frosted" with silvery white; secondaries grey, with the edges of the inner webs white.

Winter plumage (Ceylon). Bill not so bright as in summer, with the terminal portion dusky; feathers of the top of the head and nape black in the centre and white at the edges, leaving on the forehead a black mesial line only; upper part of the cheeks and the ear-coverts black; back darker grey than in summer, and the tail-feathers not so pointed as in summer. The plumage of the head varies, being in some birds blacker than in others, the forehead and lores in the latter being almost white. The black head-dress is put on in Ceylon early in March; about the 10th of that month I noticed that about one third of all the examples I met with at Jaffna were in the summer plumage. It is noteworthy that the ear-coverts in this species are black in winter and white in summer.

Nestling in down. Above white, tinged with buff; the down in most places dark-tipped; the scapulars with large spots of brown near the tips of the feathers; quills, which are just appearing, slaty, tipped with white; ear-coverts blackish. No conspicuous markings anywhere.

In first autumn plumage the scapulars and tertials and back-feathers are edged with pale fulvescent, with a dark cross bar; head much as in winter plumage, but the edgings dusky whitish; bill more tipped with black than in the adult in winter. A bird of the second year in my collection, dated November, has the feathers above the ulna dark grey, and the greater wing-coverts tinged with brownish; tail-feathers brownish grey.

Obs. A series which I have examined from S.E. Europe measure—wing 15·2 to 16·0 inches; tail 5·8 to 6·2; tarsus 1·7; bill to gape 3·0 to 3·7. Mr. Oates records the dimensions of a pair of male Burmese specimens as—length 20·0 to 20·2 inches; expanse 49·5; tail 5·4 to 5·5; wing 15·4 to 15·9; tarsus 1·68 to 1·78; bill from gape 3·7 to 3·85. In Europe the black head is doffed at the latter end of August. A specimen from the Dobrudscha, in Mr. Dresser's collection, shot on the 26th of that month, is beginning to acquire the winter dress. Gould separated the Australian bird on account of its alleged greater size and more massive form; but European specimens are quite as large as these southern birds.

Distribution.—This splendid Tern is more abundant on the Jaffna peninsula and in certain spots on the north-west coast than elsewhere in Ceylon. I met with it in the month of March in great numbers about the Jaffna Lake and the islands off the town. At Erinativoe Islands and on the Manaar flats it was also abundant; and in Calpentyn Bay I saw large numbers. Southward of this it becomes rarer, and I have not seen it below Chilaw on this side of the island. On the other coast it is not uncommon about the salt lagoons and also on the open shore to the north of Trincomalie. On the Peria-kerretje Lake small flocks were seen by me; but it is nowhere so common in this part as at Jaffna. In the south-east of the island I have seen it in March in the Kirinde and Yāla district, but in the hot weather it was not observed. The majority leave Ceylon in April, and in October their numbers are again increased. Mr. Holdsworth has seen it throughout the year at Aripu. It has not been met with in the Malay archipelago, and therefore it is to be inferred that its migration is northerly along the Indian coasts; but as it is not recorded as a very abundant species in the Empire, its breeding-haunts may perhaps be nearer Ceylon than is supposed. Jerdon states that it is by no means uncommon in most parts, frequenting rivers, jheels, and tanks; but of late years the notices of its occurrence have been rather meagre, and relate chiefly to the sea-coast. It is not found on the Andamans or Nicobars; and in the Laccadives Mr. Hume did not see it. In Burmah it appears to be very rare, as Mr. Oates only saw a pair once in the Sittang. It appears to be rare on the Hooghly, as Mr. Hume has never seen it in the Calcutta bazaar, and I do not observe any record of its occurrence further inland on the Ganges or Jumna; moreover Mr. Hume remarks that it is almost unknown in the N.W. Provinces, Sindh, the Punjab, and Rajpootana, although it is occasionally seen on the Indus after its entrance into the province of Sindh; here, as elsewhere, it proves itself a lake-frequenting species, being very common on all the inland sheets of water, as many as fifty being seen at a time on the Muncher Lake. In Kurrachee harbour it is not uncommon; and specimens were seen by Mr. Hume on the Mekran coast and at Muscat. In Persia it is common on the Shiraz and Kázrún plains in winter, the same at Lenkorán in June, and on the Caspian abundant, breeding there. Severtzoff states that it breeds in the eastern and north-western provinces of Turkestan, including the sea of Aral, and an altitude on the Thian-shan mountains of 4000 feet. It will probably be found at Lake Balkash in Russian Turkestan; but further north in Siberia it is almost unknown, as the only place that it has been recorded from is near the mouth of the Dseja. It was not met with by Prjevalsky; but in China it has been seen by Père David on lakes and streams in the interior. Swinhoe found it on the coast of the mainland in Formosa in winter, and in Hainan at Hoehow harbour in February and April. It is not found in the Philippines, and has not yet been recorded from the Malay archipelago. In Australia, however, it reappears, being found from Cape York down the east coast to Tasmania, being abundant in Bass's Straits, where it breeds in September and October. On the west coast it has not been noticed. Crossing over to Africa we find it, according to Layard, a summer visitor to the south of the continent, being not uncommon on the coasts; the same is said of Damara Land by Mr. Andersson. Up the east coast it is found at Mozambique, breeding on islands off the mouth of the Zambesi, and extending across to Madagascar, probably visiting also the Comoro Islands. It is resident in the Gulf of Aden and along the coasts of the Red Sea, as well as in Lower Egypt; but to the interior (the Blue and White Nile and the Kordofan district) it is, according to Von Heuglin, chiefly a winter visitor. It is found along the north coasts to Tangier chiefly in winter. On the western side it is recorded from Gambia, Sierra Leone, and the Gaboon. It is not common in Southern Spain, but breeds at the mouth of the Guadalquivir and near Cartagena on the S.E. coast. It is an occasional visitor to the French coast, and a rare straggler to the British isles, having occurred on the south and east coasts between the months of May and October inclusive. It is rare in Belgium, but more common in Denmark; and the late Mr. Durnford found a good many breeding in the island of Sylt, where, however, its numbers have greatly decreased within the last fifty years. In midsummer it ranges up the coast of Sweden to Tornea, at the head of the Gulf of Bothnia. It occurs irregularly on the coasts of Italy and in Malta and Sicily, but it breeds on islands on the Sardinian coast. It was observed on the coasts of Albania by Lord Lilford, has been met with in winter at Missolonghi, breeds in the marshes of the Dobrudscha, and is tolerably common on the Black Sea. It does not seem to wander across the south-eastern portion of the continent, as it has only once been recorded from Austria. It has been seen by Lord Lilford at Cyprus; and Canon Tristram obtained it in Palestine. Finally, turning our attention to the Nearctic region, we find it recorded by Professor Baird as occurring on the east coast of America in winter, as far south as New Jersey; and from Labrador through

the Hudson's-Bay waters it has found its way to the Great Slave Lake and the Mackenzie river, where Mr. B. Ross has procured it.

Habits.—This large Tern in its habits is intermediate between the Marsh- and River-Terns and those species which are exclusively found on the sea-coast. It is just as much a lake- as a shore-bird, and is particularly partial to brackish or salt lagoons near the coast, about which it may often be seen hunting quite alone or in distant companionship with one or more of its fellows, proceeding with steady powerful strokes of its long wings, which enable it to take stock of a pretty large "backwater" or lagoon in a very short time; it rarely comes back over the same ground again, as with its large bill *pointed downwards* it intently surveys the water beneath it, and is sure not to pass its prey, on which it descends with an unerring pounce. As Mr. Hume rightly observes in 'Stray Feathers,' it may be distinguished from other Terns by its habit of pointing its bill downwards; but when flying along the coast or sea-beach, and not intent on fishing, it carries its bill straight; and if the observer crouch down and keep perfectly still it will fly over him; should he, however, move it will invariably swerve off and keep out of gun-shot. Though unsociable while fishing, it collects in flocks on sand banks as the tide is just leaving them, all standing with their heads pointed the same way, and often in company with the Brown-headed Gull. While flying about it frequently utters its harsh loud note, which sounds like *krāke-krā̆*; and it has the peculiarity of flying off, uttering this note, after being shot at and wounded. I have invariably found it do this. Mr. Dresser states that it swims more than other Terns. I never saw it on the water myself, and am of opinion that it never takes to it unless under some peculiar circumstance. This author remarks that during breeding-time it will occasionally kill and devour young birds and steal eggs, after the manner of the larger Gulls. Its ordinary food, however, consists entirely of fish.

Nidification.—The Caspian Tern breeds in June, a number of pairs nesting together. Mr. Durnford, writing of the colony which he observed at the old-established breeding-place on Sylt, says:—"They lay their eggs on the bare sand, between the beach and the dunes, in a slight hollow about the size of an Oystercatcher's nest, occasionally lining it with a few pieces of shell." Mr. Dresser has found grass-bents in some nests and others without any lining at all. The eggs are usually three in number, but sometimes only two; and according to Naumann while they are being hatched the male bird displays the utmost anxiety for their safety, but afterwards when the young are out he leaves the task of defending them to the female. The eggs vary in size and shape, some being almost perfect ovals, slightly pointed at the small end; others long and somewhat compressed throughout the smaller half; but the usual shape seems to be a moderately broad oval, pointed a little at one end. The ground-colour is pale stone-grey or very pale brownish stone; the shell is slightly rough and has a moderate gloss; and the markings are normally small for the size of the eggs, consisting of dark umber-brown irregular blotches of uniform size, distributed throughout the shell on some eggs, whilst in other specimens they are larger at the obtuse end; these are mingled with smaller specks and scratches of the same hue over numerous primary or underlying markings of blue-grey, in the form of large blotches in some, and of small specks in other eggs. One example in the series before me, possessed by Mr. Dresser and collected in Sweden and Lapland, has large, blackish, irregular, partly-washed-out clouds here and there, the whole surface of the shell being openly "dusted," as it were, with small dark specks over larger blotches of the same colour as the clouds; the underlying markings are bluish grey and light umber-brown. The measurements of several specimens are—2·4 by 1·67, 2·35 by 1·74, 2·36 by 1·71, 2·65 by 1·74, and 2·55 by 1·83 inch.

STERNA ANGLICA.

(THE GULL-BILLED TERN.)

Sterna anglica, Montagu, Orn. Dict. Suppl. (1813); Saunders, P. Z. S. 1876, p. 644; Dresser, B. of Eur. pts. 61, 62 (1877); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1425 (1873); Hume, Str. Feath. 1879, p. 115 (List Ind. B.).

Sterna aranea, Wilson, Am. Orn. viii. p. 143 (1814).

Sterna affinis, Horsf. Trans. Linn. Soc. 1821, xiii. p. 199.

Gelochelidon anglica (Mont.), Kelaart, Prodromus, Cat. p. 137 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Jerdon, B. of Ind. iii. p. 836 (1864); Holdsw. P. Z. S. 1872, p. 480; Legge, Ibis, 1874, p. 33, et 1875, p. 407; Salvadori, Uccelli di Born. p. 371 (1874); Hume, Str. Feath. 1878 (B. of Tenass.), p. 491.

Gelochelidon macrotarsa, Gould, B. of Austr. Suppl. pl. 81 (1869).

Sterna nilotica, Hasselq. *apud* Hume, Nests and Eggs, iii. p. 648 (1875).

Lach-Zeezwaluw, Dutch. *Kādal kuruvi*, Ceylonese Tamils, also *Pullu* (Layard); *Simbangan*, Borneo (Mottley).

Liniya, Sinhalese.

Adult male (Ceylon). Length 14·6 to 15·5 inches; wing 12·5 to 13·0, reaching 2·0 beyond tail; tail 4·7 to 5·8 (attaining its greatest length in the breeding-season); tarsus 1·3 to 1·4; middle toe and claw 1·2 to 1·3; bill to gape 2·0 to 2·15, at front 1·5 to 1·6.

Female (Ceylon). Length 14·3 to 15·0 inches; wing 12·0 to 12·4; tarsus 1·3; bill to gape 2·0 to 2·1, at front 1·4 to 1·5.

The bill is short and high at the base in this species, with the gonys much pronounced.

Breeding-plumage (Ceylon, March). Iris hazel-brown; bill black, with a reddish tinge, the gape and inside of mouth pale red; the base of the lower mandible reddish occasionally; legs and feet black, with a slight tinge of reddish.

Forehead, including the upper half of lores, head, and nape, with a nuchal crest 1½ inch long, glossy black; lower part of the lores in a line with the nostril, face, sides of neck, and all beneath, including the under wing, axillaries, and under tail-coverts, pure white; back and wings pale blue-grey, fading into silvery greyish on the tail; quills silvery grey, terminal margins of inner webs dark grey, and the bases white; primary-shafts white. After a while, as in other species, the primaries lose the "frosting" and become dark grey. In one specimen some of the head-feathers are black, with white edges, which, in course of time, probably would turn black, proving that in this case a moult and change of colour are combined in producing the black head. This plumage is assumed in March in Ceylon.

Winter plumage (Ceylon). Bill pure black, the gape not red; legs and feet pure black.

Forehead and front of crown white, becoming gradually dusky bluish grey on the occiput and nape, on which latter the shafts are also dusky; a black spot in front of eye, in general passing round it, and spreading over the ear-coverts as a blackish patch; lores and front part of cheek striated with black. The extent of black on the auricular region is variable.

Nestling in down. "Head greyish white on the hind crown, and nape marked with a few small grey spots; a larger spot on the ear and a mark carried from the end of the gape under the cheek, both blackish grey; upper parts light grey, darker in shade than the nape and hind crown, marked with blackish-grey spots, which run into stripes, of which the four central ones are the most clearly defined; chin, throat, and underparts pure white, except the fore part of the neck, which is greyish white; bill short, pale reddish at the base, greyish in the middle, and white at the tip; iris brownish grey; feet dull reddish white." (*Dresser*, fide *Naumann*).

1st plumage (Mus. Saunders). Head grey, tinged with tawny rufescent, and the feathers with black stripes; hind neck white; back, scapulars, and wings grey, with the feathers of the interscapulary region tawny rufescent, with black shaft-lines; the tertials rufescent at the tips, and with black drop-shaped marks near the tips; tail very pale grey, with subterminal spots of blackish, and a tinge of yellowish rufescent at the tip; quills as in the adult.

Bill fleshy reddish; legs and feet brown.

A Ceylonese example shot at the end of September has acquired the bluish feathers of the upper surface and wing-coverts, and there is no dark bar along the ulna, the lesser coverts being concolorous with the greater; the tertials have black-brown patches near the tips, and edgings and indentations of fulvous buff; the tail-feathers have blackish-grey patches near the tips, with similar coloured margins to the tertials; the crown, occiput, and nape have brown mesial stripes; the loral streaks, patches in front of the eyes and on the ear-coverts are much the same as in the adult, but the latter are of a brownish hue; the primary shafts from the 3rd inwards are sullied with brown, the first three only being pure white. After the moulting of the dark-marked feathers here noticed there would be little or no sign of the young plumage in the following spring. A single new tertial feather among the dark-marked abraded ones has a small blackish shaft-stripe near the tip; and this, together with the dark primary shafts, would be the only signs of adolescent plumage in the wings.

Obs. There appears to be a noticeable difference in the size of the males and females in this species, which I do not find to be the case in all species, though it is commonly maintained that the female in this family is always the smaller. In the present bird there is also considerable individual variation. This difference is very perceptible in the feet and legs, and caused Gould to separate Australian specimens he obtained, which happened to be large, as a distinct species, *S. macrotarsa*. The American form, again, named by Wilson *S. aranea*, is identical with the Asiatic bird. An example in summer plumage, before me, corresponds, as regards the coloration of the upper surface, with Ceylonese specimens, and measures as follows:—wing 11·8 inches; tail 4·5; tarsus 1·15; bill at front 1·5. A European specimen measures:—wing 12·5 inches; tail 4·6; tarsus 1·35; middle toe, without claw, 0·9; bill to gape 2·2.

Distribution.—This well-known Tern is one of the most abundant species of its family in Ceylon, for though it is not so common on the west coast from Negombo down to Galle and Tangalla as the two Crested Terns, it is very numerous round the whole sea-board of the east and north of Ceylon, commencing at Hambantota, thence up to Jaffna, and down to Manaar and Kalpitiya (Calpentyn) Bay on the west. On the south coast it is to be found in tolerable numbers in June, July, and August, as well as during the north-east monsoon; but all the specimens I saw at the former period, and which were chiefly frequenting the salt lagoons and marshes near the coast, were in winter plumage, and were evidently non-breeding birds. In the Trincomalie district it is plentiful at the beginning of September, and I noticed some birds still in breeding-plumage, from which I infer that it may perhaps nest in the island. In the Jaffna peninsula it is a very abundant species, frequenting the lakes and the islands to the westward of the mainland, as well as the lagoons in the interior, where it consorts with the Marsh-Tern. Down the west coast as far as Manaar it is equally plentiful, and it occurs again abundantly in Calpentyn Bay; but southward of this point its numbers decrease, and it is uncommon about Colombo. Though found about inundated paddy-fields in the maritime regions, it does not stray far inland, except where there are large tanks at no great distance from the sea, such as Kanthelai or the Giants' tank near Manaar.

Though an abundant species in India, it does not frequent the islands on either side of the peninsula except as a straggler, not having been seen on the Laccadives, and only once having been recorded from the Andamans, where Capt. Wimberley procured it in November. Jerdon states that it is found in marshes, tanks, and rivers in the interior; but it appears that this applies *chiefly* to districts on the sea-board. In the Deccan it is rare, a few remaining in the summer; at Bombay it is very common, and it is presumably so on the eastern side of the peninsula, as Mr. Ball states that it is found on tidal rivers in the Godaveri-Ganges district. It is common further north about Calcutta and in Furreedpore; and on the eastern side of the Bay Dr. Armstrong found it the same in the Irrawaddy delta, whence it extends along the coast as far south as Mergui, frequenting creeks and the sea-coast as well. Towards the west of India, we find it common in jheels, lakes, and large rivers in Guzerat, Cutch, Kattiawar, and Jodhpoor. In Sindh it does not appear to be widely spread, as the only places in which Mr. Hume met with it abundantly were the Muncher Lake and Kurrachee harbour. It is a winter visitor to the North-west Provinces; but in the Punjab some remain to breed, as

Mr. Hume took the eggs on the Chenab. It inhabits Central Asia, but does not range far north in Siberia, as I only find Radde recording it from the Tarei-nor. It breeds in Turkestan, and is common in that country, according to Severtzoff. Further east, it inhabits Mongolia, the district of Ordos, and the province of Ala-shan, breeding in the Hoang-ho valley and in Southern Ala-shan. In China it appears to be rare: Père David supposes that he saw it in North China; and Swinhoe does not record it, although Mr. Saunders possesses a specimen subsequently procured by the latter at Amoy. In the Malay archipelago it has been obtained in Java, Borneo (Banjermassing), and Halmahera, while on the shores of Australia it is occasionally met with. Mr. Gould records it from Moreton Bay and from the Victoria River, North-west Australia; and Mr. Ramsay notes it in his catalogue from Rockingham Bay, Wide Bay, Clarence River, and New South Wales. Returning now to Western Asia, I find Canon Tristram recording it from Palestine, where he met with it near Beyrout; and Dr. Krüper observed it in Asia Minor, finding it breeding near Smyrna.

In Europe it is common in Greece, breeding in abundance in Missolonghi. It is found in Turkey, frequenting rivers and lakes in Bessarabia; it occurs in Transylvania, and has been obtained on the Neusiedler Lake, in Hungary. It has been met with in Malta and Gozo, as also in Sardinia, whilst in Sicily it is common. In Italy, writes Count Salvadori, it is a spring visitor, and then not abundant. In summer it extends through Germany to the shores of the Baltic, where it is rare; but in Denmark it breeds, though not now so numerously as in former years. It does not range as far north as Scandinavia, according to Mr. Dresser, nor is it found in Finland or in Northern Russia. To Great Britain it is a rare straggler, having visited only the southern and eastern coasts. In Holland and France it is only an occasional visitant, occurring in the latter chiefly on passage. It is recorded from Portugal; and in Southern Spain it is, according to Mr. Saunders, abundant in the marisma, breeding at the "mouth of the Guadalquivir and many other places." Col. Irby did not notice it about Gibraltar, but found it on the African side of the Straits in great numbers at the Ras-Dowra lakes. Canon Tristram likewise met with it in flocks in the Western and Eastern Sahara, and found it breeding at Zana. It is abundant in Algeria and in Egypt, breeding in both countries, in the latter resorting for this purpose to the lagoons of Lower Egypt. Von Heuglin states that it extends southwards to the Blue and White Nile and the swamps of Kordofan, but occurs in the southern districts only from August until March. In Abyssinia it was observed during the latter month; and on the shores of the Red Sea it was also observed in winter only. It does not range into South Africa, nor is it found on the west coast; but on the other side of the Atlantic it extends from the United States down the whole east coast, including Cuba, to Patagonia, where Darwin procured it. Dresser found it common in Texas, and Mr. Salvin in Guatemala, the only locality on the west coast where it has been seen. From Brazil Messrs. Sclater and Salvin record it.

Habits.—This widely-distributed Tern is, on the whole, more partial to fresh and brackish water than to the open coast. It frequents lagoons, estuaries, rivers, freshwater lakes, tanks, and flooded paddy-fields, and in these resorts is not unfrequently seen in Ceylon with the Marsh-Tern. It is conspicuous for the great proportionate length of its wings, which furnish it with considerable powers of flight, its movements being rapid, buoyant, and graceful. Its wings are not rapidly plied, but steadily, at a moderate rate, the length of the stroke carrying it through the air at a considerable speed. When met with on the salt lagoons of Ceylon several are generally not far from one another, coursing over their surface, and careering backwards and forwards in search of their prey. Sometimes a considerable number associate together; and at Trincomalie I have seen a large flock, together with the Small Crested Tern, hovering round the lengthy sein-nets which were being drawn to shore by the fishermen. It has a very peculiar note or laugh, which comes upon the ear with startling suddenness, and which Col. Irby not inaptly likens to *kŭh-wŭk, kŭh-wŭk*: this it often repeats several times, and then relapses into silence, not constantly uttering its call like the Crested Terns. It has another singular note, like *chē-āh*, which I have noticed more in the summer season than in the winter, and which I accordingly take to be its call-note. Its diet is somewhat varied; in Ceylon I have found it to consist of frogs, crabs, and fish; the two former are picked to pieces while being eaten. In Egypt Von Heuglin has seen it darting into the smoke of a prairie fire in pursuit of locusts; and he found it generally feeding on beetles, butterflies, &c. In Algeria Mr. Salvin noticed much the same thing, seeing it hovering over grass-fields, and descending upon grasshoppers and beetles. When pouncing upon fish it descends with a rapid swoop, but does not immerse itself in the water.

Nidification.—The only record we have of the Gull-billed Tern breeding within Indian limits is that of Mr. Hume in 'Nests and Eggs,' relating to some eggs which he found in the Punjab on a sand bank of the river Chenab. I believe that it may perhaps breed in Ceylon, and the discovery of its eggs in the island is much to be desired. It usually lays its eggs on sand or on the bare earth, scratching a hole and lining it scantily with seaweed or grass; such nests Mr. Seebohm found in Asia Minor and Greece; but Mr. Dresser detected many in America which were mere holes in the sand. Mr. Hume describes the nest he found as a depression in a tiny sand mound, crowned by a dwarf bush. This was in April; but in Europe the breeding-time is in May and June. Two or three eggs are laid in the latter region; but in America, according to Mr. Dresser, four are sometimes found. The eggs of this Tern vary considerably in ground-colour, which ranges from pale olive to brownish olive, olivaceous stone, and greyish white. Some are almost perfect ovals, others pointed at the smaller end, and some are very broad; the texture is a little rough; the markings are moderately-sized spots of dull brown, scattered pretty evenly over the whole egg, and overlying light olive-brown blotches, beneath which, again, are bluish-grey spots and clouds. A series of five specimens of the American form are on the whole whiter than a number of the Old-World race; the blotches are rather larger and darker, as also the bluish-grey clouds; but there is the same *general* character in both. The dimensions of several, taken from a large series in Mr. Dresser's collection, are:—1·93 by 1·32, 2·02 by 1·37, 1·89 by 1·34, 1·92 by 1·35, 1·96 by 1·26, 1·82 by 1·32 inch.

In a large series taken by Mr. Seebohm at Smyrna the prevailing tints are two—brownish buff and pale stony-grey or greyish white. The latter are in some instances marked with large clouds of brownish red, softening occasionally into purplish brown, and mingled with underlying blotches of purplish grey. Measurements, to show the variation in shape, are:—1·83 by 1·38, 2·0 by 1·25, 1·72 by 1·39, and 1·79 by 1·34 inch.

STERNA FLUVIATILIS.

(THE COMMON TERN.)

Sterna fluviatilis, Naum. Isis, 1819, p. 1847–48; Sharpe & Dresser, B. of Eur. pt. 8 (1871); Saunders, P. Z. S. 1876, p. 649; Scully, Str. Feath. 1876, p. 203; David & Oust. Ois. de la Chine, p. 525 (1877); Hume, Str. Feath. 1879, p. 116 (List B. of Ind.).

Sterna hirundo, Linn. *apud* Blyth, Cat. B. Mus. A. S. B. p. 292 (1849); Jerdon, B. of Ind. iii. p. 839 (1864) (errore *nirundo*).

Sterna senegalensis, Sw. B. of W. Africa, ii. p. 250 (1837).

Sterna wilsoni, Bonap. Comp. List, p. 61 (1838).

Sterna gracilis, Gould, *apud* Legge, Str. Feath. 1875, p. 376.

Hirondelle de mer, *Pierre-Garin*, Buffon; *Sea-Swallow*, *Picket*, *Spurre*, *Gull-teaser*, pop. in England; *Andorhina do Mar*, Portuguese. *Balakchi*, lit. "the Fisher," Turki (Scully).

Adult male (N. America). Wing 10·3 inches; tail 5·1 (depth of fork 2·4), outer feather 1·0 longer than the penultimate; tarsus 0·81; middle toe 0·7, its claw (straight) 0·3; bill to gape 1·95, at front 1·5. "Length 14·0: weight 3·7 oz." (*Scully*, Yarkand).

"*Females.* Length 13·5 to 14·1 inches; wing 10·5 to 10·6, expanse 30·5 to 32·0; tail 5·4 to 5·9; tarsus 0·75 to 0·85; bill from gape 1·85 to 2·0: weight 3·6 to 4·4 oz." (*Scully.*)

Breeding-plumage (N. America). Iris brown; bill coral-red, the tip of the upper mandible blackish as far back as the gonys-angle of the lower; extreme tip of lower mandible dusky; legs and feet coral-red, claws black.

Head, nape, and forehead with the lores to the level of the lower edge of the eye black; lower part of the lores, face, ear-coverts, and upper throat pure white, passing imperceptibly on the fore neck into the very pale greyish of the under surface, which changes again on the abdomen and under tail-coverts into pure white; hind neck, back, scapulars, and wings pale bluish grey, lightest on the hind neck; upper tail-coverts and central tail-feathers pure white, remainder tinged with light grey on the outer webs, those of the outermost feathers being much darker than the rest; secondaries and two inner primaries tipped with white; primaries dark grey, the 1st with the inner part of the inner web white, the next four, as in other species, with the white running out in a point into the dark colour of the tips; the outer webs and those of the primary coverts "frosted" with silvery greyish.

The under surface appears occasionally to be pure white.

Winter plumage. Bill black, tinged with reddish at the gape.

(Cape of Good Hope.) Back as in summer; head with the forehead and anterior portion of lores white; under surface white.

Young: nestling (Romney Marsh: Mus. Saunders). Head and upper surface warm creamy buff; throat blackish, sharply defined against the white under surface; crown marked with three lines of black spots; hind neck and back patched with black down the centre; wings with black spots; a group of blackish spots on the side of the rump, where the ground-colour is paler than on the back. Legs and bill yellow, the latter tipped with black, and measuring 0·43 inch at front.

In first plumage. The forehead and front of the crown with the anterior portion of the lores are white, the top of the head, occiput, and nape blackish brown, descending to the cheeks behind the eye, and passing round in front of it; hind neck white; back brownish grey, the feathers tipped with white, and marked with irregular pencillings of brown near the margins.

Immature (2nd year?) (October till April, Trincomalie). Iris brown; bill reddish black, reddish at the base of the lower mandible, extreme tip pale; gape and palate red; legs and feet dusky orange. In one April specimen the

legs and feet are orange, and in all the webs are lighter than the tarsus. Two examples shot in June: *bill blacker* than in April, with little orange at the gape; tarsus dusky brownish, mingled with yellow.

Length 12·5 to 13·6 inches; wings (all abraded) 9·5 to 10·2; tail 4·6 to 5·2, depth of fork 2·0 to 2·2, outer feathers 1·0 longer than the penultimate; tarsus 0·7 to 0·8; middle toe 0·7, its claw (straight) 0·3; bill at front 1·2 to 1·30, to gape 1·7 to 1·85.

In all these specimens (seven) the forehead and lores are pure white, becoming gradually mixed with blackish on the crown; the occiput, nape, and sides of the head behind the eye brown-black, with also a black edging in front of the eye; a dark-brown band along the ulna; back blue-grey in some, mixed with brownish-tipped feathers, the remains of the last season's plumage; the tails which are in new feathers in the April specimens, have the outer webs dark grey, paling successively towards the centre, the tips white; the central tail-feathers, the coverts, and rump are *blue-grey, paler than the back*; under surface and hind neck pure white.

Obs. An example from Cayenne measures as follows—wing 10·6 inches, tail 5·5, tarsus 0·73, middle toe 0·7, bill to gape 1·9; one from the Cape—wing 10·7, tail 5·7, bill to gape 1·9. I have given Dr. Scully's measurements of Yarkand examples above. An example among the immature birds here described was identified by Mr. Howard Saunders as the Common Tern; and since my return to England this gentleman has not altered his opinion. I have compared my series with examples of the Common Tern from various collections, and they appear to assimilate better with that species than with any other; but there remains the curious fact of the bills becoming blacker towards the summer instead of redder; the June examples, which had blacker bills and darker legs than the April, had, however, not begun to acquire the black cap, though the tail-feathers and primaries, except the first two (which in all Terns are the last to be shed), had been newly acquired. The assumption of the black bill in the summer points to a connection with *S. longipennis*, Nordmann, a North-east Asian species, which Mr. Hume says is found on the coasts of India. It is to be hoped that mature examples will be procured in Ceylon at a future period, and more light thrown upon the identity of the species. In none of my specimens is the gonys as long as in the above examples from America. Two examples of *S. longipennis* from Kamtschatka, in Mr. Saunders's collection, measure as follows:—wing 11·0 to 11·2; tail 6·5 to 6·8; tarsus 0·8; bill to gape 1·9. The bills are black, palish at the base beneath, and the forehead, head, and nape are black. It is a slenderer bird than the Common Tern.

Mr. Saunders has lately (P. Z. S. 1876, p. 649) described an allied species to the Common Tern from Thibet and Lake Baikal, under the name of *Sterna tibetana*. It resembles the former to a great extent, differing "in having the sides of the neck, shoulders, and flanks clear grey, which assumes a darker and more vinous tint on the breast and abdomen; the mantle and wings are also much darker;" bill and feet as in the Common Tern.

The Arctic Tern (*S. macrura*, Naum.), which has often been confounded with the present species, has the bill entirely red in the summer, the tarsus much shorter, not exceeding 0·55 inch, and the tail reaches beyond the closed wings.

Distribution.—A specimen of the Common Tern was sent to the Calcutta Museum by R. Templeton, Esq., in 1846, and since that time until 1875 no record of its occurrence in the island was published, both Layard and Holdsworth omitting to notice it in their lists. In October 1874 I met with a number in Kottiar Bay, near Trincomalie, and secured specimens. I did not notice it then until the height of the netting-season, when great numbers, mixed with the Gull-billed and some Crested Terns, used to frequent the bays on each side of the Fort, and live on the sardines which swarmed in shallow water near the beach. They disappeared in June, about the time that large flocks of the Roseate Tern passed over that part of the coast; but the following season they were again about the port; but I never saw them inside the harbour. In March 1876 I think I identified it on the wing in Jaffna Lake, but procured no specimens. From all accounts it seems to be rare in India; for though Dr. Adams informed Jerdon that it was common on the Indus, rivers of the Punjab, and lakes of Cashmere, Mr. Hume never once saw it in his tour through Sindh and exploration of the Indus. Jerdon states that it is rare in South and Central India, having only been seen by him from the lake at Ootacamund; but no one else has met with it since. In Kashgharia Dr. Scully found it abundant, arriving there in April, breeding in April, and leaving again in September. It occurs to the eastward in China, on the rivers of the interior, according to Père David; and Swinhoe met with it at Hankow on the Yang-tse-kiang. It does not appear to range northward into Siberia, being there replaced by *S. tibetana*. From Turkestan, in the eastern portion of which it breeds, according to Severtzoff, it ranges into Asia Minor, through Persia, and is found on the Caspian Sea and on the Black Sea, Sea of Marmora, and Bosphorus, arriving in these waters in April, and probably breeding there. It likewise occurs in the Mediterranean islands, and on

the coasts of Sicily and Italy in the spring, remaining in Sardinia throughout the summer. It breeds in Transylvania, and is found northward to the Baltic sea, remaining on the Rhine from May until August. In Denmark it is abundant, and it follows the coasts of Sweden to Uleåborg at the head of the Gulf, where Mr. Dresser found it abundant. Along the coasts of Norway it is distributed as far north as Lofoten; and it has occurred once in Iceland, though not in the Faroes or in Shetland. It is abundant in Holland in the breeding-season, and is a regular summer visitant to England, Ireland, and Scotland, breeding at Dungeness, Ramsay Island, and the Farne Islands, Foulney Island, and on Strangford Lough. In France it is common, breeding in Picardy and on the Loire. In Spain it is abundant, and breeds on the coast on the Mar Menor, which Mr. Saunders considers as its southern breeding-limit. It likewise occurs in Portugal, and extends to the Atlantic isles, breeding in the Azores, the Canaries, and Madeira. Along the north coast of Africa it is found from Morocco to Egypt, where it occurs in winter and spring. Von Heuglin says it is seen throughout the year in the delta; but he never noticed it on the Red Sea. It extends to the Cape of Good Hope, most probably by the way of the west coast, as it has been recorded from Senegambia. Layard found it at all times of the year at the Cape, and Mr. Gurney mentions an instance of its occurrence in Natal.

Finally, in America it is found all down the Atlantic coasts from Labrador to Texas in spring and autumn, collecting in the latter place in summer, and breeding on the islands in Galveston Bay.

Habits.—This well-known Tern has much the same mode of living as the Gull-billed Tern, frequenting bays, harbours, estuaries, backwaters, and likewise lakes and rivers far inland. It is active and buoyant on the wing, and associates in moderately-sized flocks, which fish in close company with other species; and while following a "school" of fish, or hovering over and plunging into a school of sardines or other small fry, it is, like the Crested Terns, very noisy, continually giving out its note as it plunges headlong into the living mass, and in its excitement scarcely waits to swallow its prey before darting again into the water. They are fond of flying about the bars of rivers on the watch for fish crossing the shoal water; and a favourite spot at Trincomalie for them, as well as for other species, was the corner of Back Bay and the north side of the Fort, for here the sardines collected in enormous shoals, and furnished them abundance of food. When the strong south-west winds set in in April, *blowing off* the land, these and other Terns used to appear in greater numbers than at other times. It is not at all shy, pouncing on fish close to a boat, or near people who may happen to be bathing or fishing. When hovering over fish (which they are much in the habit of doing) they give utterance to a metallic-sounding *twink*, by which I could always identify them at no little distance. This piping note is quite different from that of any other Tern frequenting Ceylonese waters. In an interesting account given by Macgillivray of their habits in Great Britain, this author attributes an inquisitive propensity to them, such as is very noticeable in the Gull-billed Tern. He says, "When walking along the sandy shore, no bird nearer, perhaps, than a quarter of a mile, you may see one or two of them coming up from a distance, increasing their cries as they approach, then wheeling and plunging over and around you, and at length flying off." He likewise asserts that they often alight on the water and swim a little; but this I have never seen them do. When tired of fishing in Ceylon they rest on the sea-beach in little groups of three or four. I have found their food to consist entirely of fish; but they are said to eat sand-eels, small crustaceans, &c. Mr. Gurney, jun., gives an interesting account, communicated to Messrs. Sharpe and Dresser, of a pair of these Terns which were tamed by a taxidermist at Stockton-on-Tees, and which used to come to his call or whistle as they flew about his house.

Nidification.—The Common Tern breeds in May and June, either making an apology for a nest in the shape of a little depression lined with a few dry grasses, or laying its eggs upon dry drift grass or salt marsh. In sand, Macgillivray says that they make a depression without any lining; and the situations they generally choose are sandy tracts or pebbly ridges on the shore, rocky ground, or sometimes low rocks. The eggs are usually three in number, and are of a dull clay-buff, olivaceous stone, pale greenish, and brownish-buff ground-colour, and in shape are pointed ovals, well rounded at the obtuse end. One specimen in the series before me, in the possession of Mr. Dresser, is uniform dull white, and measures only 1·56 by 1·12 inch. The markings in general consist of large blotches of deep (blackish) sepia, which, on the boldest-coloured, are chiefly collected

round the obtuse end; these are mingled with light brown spots and blotches, beneath which are the usual bluish-grey and purple clouds. The dark markings are, as a rule, somewhat regular-edged. The dimensions of several are 1·67 by 1·23, 1·79 by 1·23, 1·73 by 1·22, and 1·65 by 1·21 inch.

Some eggs are richly clouded with red-brown, running in an oblique direction across the shell; and one specimen, in a large series collected by Mr. Seebohm, has a zone of hieroglyphic blotches at some distance from the obtuse end, mingled with blots of bluish grey, the rest of the egg being almost devoid of markings. Two opposite extremes in size in this series are 1·81 by 1·09 and 1·55 by 1·19 inch.

STERNA SINENSIS.

(THE WHITE-SHAFTED TERNLET.)

Sterna sinensis, Gm. Syst. Nat. i. p. 608 (1788), ex "Latham"; Saunders, P. Z. S. 1876, p. 662; Hume, Str. Feath. 1879, p. 116 (List Ind. B.).

Sterna minuta, Linn., Horsf. Trans. Linn. Soc. 1821, xiii. p. 198.

Sternula minuta (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 292 (1849, in part); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271; Jerdon, B. of Ind. iii. p. 840 (1864, in part).

Sternula sinensis (Gm.), Swinhoe, Ibis, 1863, p. 430; id. P. Z. S. 1871, p. 422; Holdsw. P. Z. S. 1872, p. 481; Legge, P. Z. S. 1875, p. 377; id. Str. Feath. 1875, p. 377, e 1876, p. 246; id. Ibis, 1875, p. 407; David & Oust. Ois. de la Chine, p. 527 (1877).

Sternula placens, Gould, Ann. & Mag. Nat. Hist. 1871, viii. p. 192; id. B. of N. Guinea, pt. iii. pl. 7 (1876).

Chinese Tern, Latham; *The Lesser Indian Tern* of some.

Characteristics. *Stout, black-tipped yellow bill; long tail, deeply forked; whitish rump and tail; 1st two quills black, the 1st with a white shaft, the 2nd with a pale shaft, having a white streak along the centre; primary-coverts pale grey.*

Adult male and female (summer, Ceylon). Length 9·2 to 10·5 inches, according to length of outer tail-feathers; wing 6·8 to 7·3; tail (in perfect specimens) 4·0 to 4·3, outer tail-feather 1·6 longer than the adjacent, and 2·2 longer than the central pair; tarsus 0·65 to 0·7; middle toe 0·53 to 0·56, claw (straight) 0·45; bill at front 1·2 to 1·3. Lateral tail-feathers much attenuated. Females are slightly smaller than males.

Iris hazel-brown; bill gamboge-yellow, sometimes without a dark tip, but generally with more or less of the tips of both mandibles, for a distance of 0·35 inch, black; legs and feet orange-yellow. In some females the legs are dusky orange.

Summer plumage (Minery). Crown, occiput, nape and its sides, down to the level of the lower edge of the eye, as also a broad band from the nostril-membrane to the eye, black; forehead white, passing in a point above the eye to about its centre; mantle, scapulars, and wings very delicate blue-grey, paling to white on the upper tail-coverts and tail, and almost into the same on the hind neck; first two primaries black, with the inner margins white, and also the shaft of the 1st quill, that of the 2nd white along the centre; remaining primaries delicate grey, frosted on the outer webs, their shafts whitish; first two primary covert-feathers blackish grey; secondaries with white outer margins near the tips; all beneath white. In some specimens the under tail-coverts next the vent are tinged with grey.

Winter plumage (Hankow, China). Bill brownish yellow; legs and feet dusky yellow; outer tail-feathers not attenuated, 1 inch longer than the adjacent pair.

Forehead and crown white, shading into the black of the nape; sides of the crown behind the eye black, joining with that of the nape; lores just in front of the eye blackish. The black head is assumed about April in Ceylon.

Young, in down (Hambantota, June). Bill fleshy red, with dusky tip; legs and feet fleshy red; ground-colour of the upper surface rufescent whitish, with three dark stripes over the crown; upper surface mottled with black; beneath dusky whitish.

Male, soon after flying. Wing 4·5 inches; bill at front 0·65. Bill, lower mandible and edge of upper fleshy yellow, culmen and tip cf lower mandible dusky; legs and feet dingy yellow.

A black spot immediately in front of the eye; lores mouse-grey, tinged with tawny over the crown, which, with the nape and the space behind the eye, is black, edged, except on the latter part, with fulvescent, the black passing into the grey of the forehead; hind neck, back, scapulars, and tertials yellowish tawny, with black oval-shaped markings and dark centres; wing-coverts slate-grey, the median edged with fulvous yellow, with an adjacent

blackish border; quills dark silvery grey, the first two visibly darker than the rest and with whitish shafts; tail pale slate-grey, tipped broadly with tawny yellowish, which is set off by a black border; beneath white.

Before the young fly the tawny-yellow coloration is isabelline grey, almost reddish.

About three weeks older than the above. Wing 6·4 inches, reaching 1·0 beyond the tail, which is forked to a depth of 0·75.

Iris brown; bill brownish yellow, gape and base of lower mandible dingy yellow; legs and feet dusky yellow, joints and sides of the webs brownish.

Forehead still mouse-grey, the feathers of the crown margined with fulvous, those of the nape slightly tipped with it; a whitish stripe above the black loral spot; the marginal coloration of the mantle not so tawny, but greyer; wing-coverts bluish grey; the lesser series dark grey, and the median with the edges fulvous grey; rump and upper tail-coverts pale slaty, the lateral feathers white; tail-feathers whitish, the central pair slaty grey, the lateral pair unmarked, the blackish markings at the tips of the remainder modified into elongated spots.

By degrees the feathers of the occiput and nape become black, and the forehead and margins of the coronal feathers white; the back-feathers are moulted slowly to blue-grey, the colour of the 1st winter, but the tail and wing-feathers are retained, as in other species; and specimens are shot at the end of the year in this mixed plumage. The bill is blackish, tinged with yellow then; the legs and feet dusky yellow.

Obs. The colour of the first two primaries varies a little, owing to exposure, which wears off the bloom of the first, and gives it a darker appearance than the second (see variety *a*, P. Z. S. 1875, p. 377). The bill, though varying somewhat in stoutness, has always a more pronounced gonys than the next species. It does not assume its normal shape and sharp tips until the bird is about five months old. Chinese specimens before me are slightly darker on the back than Ceylonese. A small series varies in measurement as follows:—wing 6·7 to 7·2 inches; bill to gape 1·5 to 1·7; outer tail-feathers in an April specimen, in full breeding-plumage, 2·6 longer than the adjacent pair. An example from Celebes measures—wing 7·5 inches; tail 4·5; bill to gape 1·7.

The Australian Little Tern (*Sterna nereis*, Gould) has the bill very straight and highly compressed and the gonys very long, the tip blackish; legs and feet yellow. The lores are white, with merely a black spot in front of the eye; upper surface exceedingly pale; tail white and deeply forked; and the primaries silvery grey, with the 1st quill dark just adjacent to the shaft, which, with those of the others, is pure white. A specimen before me measures—wing 6·5 inches; tail 3·8; bill to gape 1·7.

As the Black-naped Tern, *St. melanauchen*, is not unlikely to occur in Ceylon, I here subjoin a description from Chinese specimens:—

Adult (China). Wing 8·5 to 9·0 inches; tail 5·5 to 6·0; tarsus 0·7; middle toe 0·6; bill to gape 1·75 to 2·0; outer tail-feathers 3·5 to 3·8 longer than middle pair. Bill very slender. (Mr. Hume gives the length of 24 Andaman specimens as 12·9 to 14·5 inches; weight 2·7 to 3·75 oz.)

Iris brown; bill blackish; legs and feet black.

Head, crown, hind neck, entire under surface with the under wing pure white; a black band passes from the middle of the lores to the eye, widens behind it, and passes in a crescentic shape round the occiput, where it develops into a short crest; back and upper tail-coverts *very delicate* grey; the wing-coverts slightly darker; the quills white, faintly shaded with the palest grey, and with the outer web of the 1st dark grey. In freshly killed individuals the under surface is adorned with a beautiful roseate hue.

Distribution.—The White-shafted Ternlet is a very abundant species on the south-western, eastern, and northern coasts of Ceylon, but is chiefly noticeable during the breeding-season, when large numbers congregate together in certain localities to rear their young. Whether they, to a great extent, leave the island during the cool season, or are so scattered along the whole sea-board that one does not take notice of them, I am not quite prepared to say; but I incline to the former hypothesis, as in some places where they are numerous in the breeding-season, they are rarely seen between the months of November and April. In the nesting-time it is chiefly found about salt lagoons and backwaters and on contiguous portions of the coast; in such localities it is common from Hambantota to Batticaloa, and from Trincomalie to Jaffna. During my residence at Trincomalie I seldom noticed it either on the lagoons about the Fort or in Kottiar Bay until March, after which it steadily increased in numbers till May, when the majority disappeared for their breeding-grounds on the shores of salt lakes. It extends inland at this season, and breeds in considerable numbers at large tanks, such as Kanthelai, Minery, Girentala, and other sheets of water which are deep, well supplied with fish, and

free from reeds or overgrowth, and the shores of which are grassy or gravelly. On the west coast it ranges down to Puttalam, but is rare south of that place. All the specimens procured at Colombo during the cool season belonged to the next species, and at Galle I likewise never procured it. It is often to be seen some distance away from the coast, and frequents the vicinity of the Bass Rocks in great numbers.

In India its range is scarcely satisfactorily worked out, as I find that the Little Terns from most localities are set down by Mr. Hume as belonging to the next species, and to a form which he styles *S. gouldi**, which appears to be a local race of the true *S. minuta* of Europe. The present species no doubt occurs along both coasts to the north of the empire; and Mr. Hume speaks of specimens with two dark, white-shafted primaries being shot while breeding on the Ganges, which appear to me to belong to the same form as our bird, in spite of the rump being grey; for to cast aside such a good distinguishing character as the two dark primaries with white shafts, on account of a difference in the hue of the rump, does not seem to me expedient, inasmuch as it opens the door to the admission of innumerable unsatisfactory races. To the eastward this species extends to China, whence it was first described as the Chinese Tern by Latham; and I have no doubt that it will some day be observed on the coasts of Tenasserim and in the Andaman Islands. Swinhoe records it from China and Formosa, and he found it breeding on the east coast of the latter. It has not been noticed at the Philippines, but it is found in some, and probably will occur in almost all, of the islands of the Malay archipelago. I have seen it from Celebes; and in all probability the Ternlet set down by Salvadori as *S. minuta* (Uccelli di Borneo, p. 378), and recorded from Java, Borneo (Banjermassing, Pontianak), Celebes, Timor, and New Guinea, belongs to this species, some localities perhaps also relating to the next, *S. saundersi*. In Australia it is found down the coast from the Gulf of Carpentaria and Cape York to New South Wales, southward of which it is replaced by the White-lored Ternlet, above noticed. Mr. Ramsay records it from the south coast of New Guinea in his catalogue of the birds of Australia; and Mr. Gould has figured it from this region, where it is doubtless not uncommon.

Habits.—This Ternlet, when not breeding, chiefly frequents the open coast and large bays or inlets of the sea, as well as the mouths of rivers, in which latter it affects the bars where the water is shallow and fish are easy to catch. It is also found on salt lagoons near the sea, but not so plentifully as in the localities just mentioned. In the interior it is partial to the description of tank or lake above mentioned, and is consequently localized to some extent. For instance I saw numbers at the deep open sheet of water, between Minery and Pollanaruwa, which is called Girentala; but at Topare tank, which is choked with vegetation and a favourite haunt of the Marsh-Tern, not a single Little Tern was to be seen. It is a bird of strong and swift flight; but the beat of its wings is somewhat slow, although powerful and productive of considerable speed. Little flocks of half a dozen or more may be seen flying round a particular spot where they have detected an abundance of food, each one now and then hovering over the fish with its bill pointed downwards and suddenly dropping like a stone upon those who are incautious enough to venture too near the surface. It has a parrot-like monosyllabic call, not unlike one of the notes of the Purple-headed Parrakeet, by which peculiar note it may always be distinguished from the next species. This it frequently utters when flying at great speed towards its breeding-place, when it may often be seen carrying fish in its bill. I have never detected any thing else but fish in its stomach; and I think its food principally consists of it, though it may feed to some extent on insects, sand-worms, minute shells, &c. It rests on sand banks or on the open beach, and may sometimes be seen seated on the little dividing ridges which separate the fish-pools constructed by the natives in the various salt lagoons on the east coast.

Nidification.—This species breeds from June until August, the time in the south of the island being from the middle of the former month till the middle of July. At the tanks in the north of Ceylon it lays somewhat later, although I have seen birds carrying fish to their young in June on the salt lakes in the Trincomalie district. The localities chosen are the dry, perfectly level, earthy shores of the leways or salt lagoons of Hambantota, the sandy flats bordering some of the brackish lakes on the north-east coast, and various gravelly or dried-up wastes on the shores of the large tanks in the interior. On the island already alluded to in my

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* Preoccupied by Reichenbach in 1856 for *S. fuliginosa*.

article on the Stilt, p. 923, which, in the dry season, is connected with the northern shore of Kanthelai tank, numbers of nests were found in the first week in August, the majority being situated among gravel and shingle, and consisted of a little hollow scooped out and sometimes lined with a few pieces of twig, grass-stalk, or other material collected from the flood-wreck. The perfectly flat and extensive shores of the leways, formed by the drying up of the salt-pans, are, however, better adapted to the habits of this species than gravelly places. There they stamp out a tiny very shallow hollow and lay their eggs, without any lining at all. In some cases these hollows are almost imperceptible, and the eggs repose on the flat, powdery, half sandy, half earthy ground. No two nests are nearer than 10 feet to one another, and the usual number of eggs is two. In some nests three were found, and in one six; but the latter were the product of two birds, as some of the number had been rolled out to the side of the nest, showing that the nest had been taken possession of by another bird after the rightful owner had laid her eggs. The birds were seated or standing by their eggs, and always rose when I was at some distance from them, but afterwards displayed considerable courage, flying round and round close to me, and screaming and swooping down as their eggs were approached. These were divisible into several types, some being long ovals, nearly equal in size at both ends, some pointed ovals, others oval, stumpy at the small end and rounded at the opposite, and not a few were short, broad, very rounded eggs. The first mentioned are dealt with in the succeeding article, as they are presumed to belong to another species, many of which were at this breeding-ground. The eggs of the other types were stone-grey, yellowish buff, slightly brownish buff, and olivaceous grey in ground-colour, and were, for the most part, marked with small and rounded blots and blotches of dark sepia and rich brown of several shades, mixed with underlying blots of bluish inky and purplish grey, which are pretty evenly scattered over the whole egg; others are entirely marked with reddish-brown specks and short dashes mixed with small specks of underlying pale colour; and some are streaked and pencilled with straggling lines of olive-brown over blots of pale bluish grey. Various specimens measure—1·26 by 0·96, 1·3 by 0·95, 1·2 by 0·93, 1·21 by 0·92, 1·23 by 0·96, 1·34 by 0·91, 1·2 by 1·0, and 1·13 by 0·96 inch, the two latter being remarkably rounded eggs.

When getting fledged, the young run fast and hide themselves among stones, to which their colour assimilates so nearly that it is difficult to see them.

STERNA SAUNDERSI.

(THE GREY-RUMPED TERNLET.)

Sterna sumatrana, Raffles, *apud* Saunders, P. Z. S. 1876, p. 663; Hume, Str. Feath. 1878 (B. of Tenass.), p. 493.

Sternula minuta, Linn., Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271 (in part); Hume, Str. Feath. 1876, p. 469.

Sterna saundersi, Hume, Str. Feath. 1877, pp. 224, 225 (note); id. Str. Feath. 1879, p. 116 (List B. of Ind.).

Characteristics. *Slender dark bill; short tail; grey rump, upper tail-coverts, and tail; first three quills blackish grey, with blackish shafts.*

Adult male (Hambantota, June). Length 6·8 inches; wing (imperfect) 6·3; tail 2·7, fork 0·6 deep; tarsus 0·65; middle toe 0·49; bill at front 1·05, gonys 0·75.

Iris brown; bill yellowish brown at base, then dusky yellow, and black at the tip for 0·5 inch; legs and feet yellowish brown, claws black. The bill in this specimen has the appearance of changing to a yellowish hue.

Crown, occiput, and nape black, as also a broad band from eye to nostril, the boundary of the black behind the eye on a level with the lower edge of the eyelid; forehead white, extending in a band as far back as the middle of the eye; back, wings, *rump, and upper tail-coverts* blue-grey; tail somewhat paler, the inner webs of all but the central feathers white; first *three* primaries greyish black, the inner half of the inner webs white, the shafts *jet-black*; remaining primaries and secondaries blue-grey; *all* the primary-covert feathers blackish grey; cheeks, ear-coverts, entire under surface, and under wing pure white.

Winter plumage (Jaffna, March). Length 8·1 inches; wing 6·9; tail 2·5; tarsus 0·65; middle toe and claw 0·75; bill at front 1·2, gonys 0·75.

Bill, if any thing, blacker than in the above, there being less of the yellow tint; legs and feet the same as in summer. The bills in some examples at this season are yellower than in others, and all have the appearance of being in a state of change to yellow in the basal part.

Forehead and front of lores white, passing into greyish on the crown, and thence into blackish on the occiput, nape, and the space between the latter part and the eye; a black spot in front of the eye; upper surface as in summer; outer tail-feathers white, slightly sullied with grey; primaries and their coverts as in summer. In old feather the 1st primary-shaft is often so bleached by the sun that it is almost pure white; the 2nd, however, remains blackish; and birds may be procured in the spring while moulting with the 2nd primary new and black-shafted and the 1st old and white-shafted.

Young. The nestling is in all probability indistinguishable from that of the last species.

Immature, in first plumage (October). *Male and female.* Length 7·9 to 8·0 inches; wing 6·6 to 6·7; tail 2·2 to 2·5, depth of fork 0·5; bill at front 1·05 to 1·1.

Bill black, yellowish at gape and along the edge of the lower mandible; legs and feet yellow-brown, toes darker than web.

Forehead grey, passing into brownish on the crown and blackish brown on the occiput, nape, and behind the eye, the feathers of these parts tipped with greyish; hind neck bluish grey; back and scapulars grey, with white centres and edges, separated by broad brownish pencillings; rump and tail blue-grey, tinged with brownish; the outer tail-feather whitish, remainder marked with brownish near the tips; tertials with pale margins and inner brown borders, breaking into bars on the inner webs; lesser wing-coverts brown; median slate-grey, edged with brown; first *six* primaries greyish black, the first *four* with jet-black shafts; beneath as in the adult. An older specimen has the back mostly blue-grey, with a few blackish-marked feathers, and the dark edgings of the median wing-coverts nearly vanished from abrasion.

After the acquisition of the grey plumage in the first winter, the dark band along the ulna is the only sign of immaturity remaining; the bloom is then worn off the primaries, which are not changed with the clothing-feathers in autumn, and they are very dark, as also their coverts.

Obs. I have followed Mr. Hume in applying the title *saundersi* to this species instead of *sumatrana*, which has been adopted by Mr. Saunders, because I think Raffles's description of his small species from Sumatra does not satisfactorily apply to our bird. It is that of a young bird, and is as follows :—" A small species, with a short tail and wings about the same length with it. The prevailing colour is white, tinged on the back, head, and wing-coverts with light reddish brown, and mixed with a few dark spots ; *a blackish crescent extends from eye to eye, round the back of the head* ; wing-feathers lead-grey, the *first one nearly black* ; lower parts more white ; tail of the same colour as the back " (Trans. Linn. Soc. xiii. p. 329, 1822). Now in our bird, when immature, nearly all the primaries are black, and, further, there is no such crescent from eye to eye. It is probable, as Mr. Hume suggests, when he proposed his title in honour of Mr. Saunders, that Raffles was dealing with the Black-naped Tern, *S. melanauchen*. I would add that Indian specimens of *S. saundersi* are clearly the same as Ceylonese, as there could not well be two species of dark-rumped Little Terns in these regions.

The specimen above described is not perhaps in perfect breeding-plumage, and the organs were but little developed. It appears, from data given by Mr. Hume concerning a specimen taken at Kurrachee off the eggs, that the bill is yellow, broadly tipped with dusky ; and this was what my specimen was turning to. The dimensions of this Kurrachee bird are :—length 9·12 inches ; wing 6·43 ; tail 3·0 ; tarsus 0·6 ; bill at front 1·12, from gape 1·5.

S. minuta, Linn., the European representative of this species, is found in India, as I have seen specimens collected at Futtehgurh not to be separated from Spanish birds, though the upper tail-coverts were scarcely so white. It differs from the present species in having a stouter bill, the black of the crown not generally coming so far forward in a point upon the forehead, in the *first two quills* and the *first two primary-covert feathers* being black, with black shafts, the remaining feathers being grey ; and finally in the *upper tail-coverts and tail being white* : wing 6·5 to 7·0 inches, bill at front 1·1 to 1·2. Indian specimens incline towards a greyer rump than European ; but the quills are coloured in the same manner, and the character in question is a slight local variation only.

In specimens from hot climates (one from Tonghoo and another from Abyssinia are before me) the *centre of the shaft* of the first quill becomes bleached from the effect of sun and salt-water, and the bird looks at first like the last species ; but the second quill-shaft is always jet-black, which is a characteristic of true *minuta*. This peculiar feature seems to me to have caused erroneous theories as to this latter bird not being found in India, and I imagine is one of the characteristics of Mr. Hume's *S. gouldi*, combined with the trifling greyish tint of the upper tail-coverts before mentioned. I have, however, never found an example in Ceylon with two black-shafted black-webbed quills and pale rump ; and I therefore do not admit the species into our lists. Mr. Saunders recognizes a form intermediate between the Grey-rumped and the White-rumped Ternlets (*S. minuta*), which is found on the coasts of America, and to which he applies Lesson's title, *S. antillarum*. It has the bill more slender than the White-rumped, but not so attenuated as the Grey-rumped Ternlet, and the rump and upper tail-coverts are pearl-grey, like the mantlet. It appears to me, after examining his specimens, to be scarcely separable from the former species.

Distribution.—This Ternlet is not so abundant in Ceylon as the last species ; but it is widely distributed, being found even on the west coast in the north-east monsoon. It may often be seen on the Colombo Lake from November till March ; and it is likewise met with on the Negombo, Bolgodde, and Amblangoda lakes. On the south-east coast it occurs in tolerable numbers, but not so plentifully as the White-shafted Ternlet, although in the breeding-season apparently a fair percentage of all the Ternlets I saw there belonged to it. I have met with it at Batticaloa, and further north, in the Trincomalie district, it is as common as it is at Hambantota. In the Jaffna peninsula it seems to be almost as numerous as the white-shafted species, as most examples I shot on the Jaffna Lake in March belonged to it ; they were beginning then, in some instances, to acquire the black summer cap. It is found on the coasts of India and Tenasserim, and is common in the Laccadives ; but I see no record of its occurrence at the Andamans. It has been obtained at the mouth of the Laynah creek, south of Mergui, and is believed by Mr. Davison to inhabit the Mergui archipelago. Mr. Hume has recorded it from Madras, and also from the Sutlej river, where it apparently breeds, as the specimen in question is said to be a nestling. It is common at Kurrachee and breeds there. Beyond the confines of India to the westward its distribution is but little known. Mr. Saunders has seen a specimen from Zoulla (Red Sea) which he identifies with this species ; and likewise has an example in his own collection from Fantee, west coast of Africa.

Habits.—This Ternlet much resembles the last species in its habits. Its flight is quite as swift, and it has the same fashion of hovering over the water with bill pointed downwards, and then plunging perpendi-

cularly on its prey. It is fond of resting on sand banks at the base of creeks and lagoons in little troops of a dozen or so; and it may generally be seen thus assembled about 10 or 11 in the forenoon, reposing after its morning's hunting. Its note is quite different from the Parrot-like pipe of the white-shafted bird, and it is not so noisy. I have noticed it more about fresh water in the cool season than this latter; it is the common Ternlet on the Pootoor lagoon and also on the Colombo Lake.

Nidification.—As there were many examples of this species at the breeding-station of the Ternlets near Hambantota, and as I shot them while flying in from the sea with food in their bills, there is every reason to infer that some of the nests I found belonged to it. In a few there were eggs of a different type to that of the majority of specimens I took; they were rather larger, and marked with large blots or clouds of rich sepia of several shades over lighter clouds of bluish grey, brownish grey, and purple-grey, the smaller end of the shell having a few more reduced spots. In some the markings were slightly straggly, in others they were rather regular. The ground-colour varied from pale greenish stone to brownish buff. They vary from 1·25 by 0·91 to 1·35 by 0·93 inch.

Captain Butler describes the eggs he took at Kurrachee belonging to this species as pale drab with a faint greenish tinge, or greyish stone-colour with primary streaks, blotches, and spots of deep brown, and secondary (that is, the underlying) clouds of pale inky blue. The nests were, as in Ceylon, slight depressions in the ground, the eggs in some cases being deposited in wheel-ruts and horse-footprints.

STERNA BERGII.

(THE LARGE CRESTED TERN.)

Sterna bergii, Licht. Verzeich. p. 80 (1823), *ex* South Africa; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1436 (1873); Legge, Ibis, 1874, p. 33; Saunders, P. Z. S. 1876, p. 657; Hume, Str. Feath. 1876, p. 470, et 1878, p. 493 (B. of Tenass.), et 1879, p. 116 (List B. of Ind.); Butler, ibid. 1877, p. 298.

Sterna cristata, Steph. in Shaw's Gen. Zool. xiii. pt. 1, p. 146 (1825); Salvadori, Uccelli di Born. p. 376 (1874).

Sterna velox, Rüpp. Atlas, p. 21, pl. 13 (1826).

Sterna pelecanoides, King, Surv. Int. Austr. ii. App. *Aves*, p. 422 (1826); Legge, Ibis, 1875, p. 407.

Thalasseus pelecanoides (King), Gould, B. of Austr. vii. pl. 23 (1848).

Thalasseus poliocercus, Gould, B. of Austr. vii. pl. 24 (1848).

Thalasseus cristatus (Steph.), Blyth, Cat. B. Mus. A. S. B. p. 291(1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Holdsw. P. Z. S. 1872, p. 481; Jerdon, B. of Ind. iii. p. 842.

Thalasseus bergii (Licht.), David & Oust. Ois. de la Chine, p. 523 (1877).

The Crested Tern, *The Larger Sea-Tern*, *The Swift Tern* of some. *Kādal Kuruvi*, Ceylonese Tamils; *El Hekt*, Arabic (Heuglin); *Tola* in the Friendly Islands.

Liniya, Sinhalese.

Note. The present species, the next in order, and one or two allied Terns form a small well-marked group, with stout rather curved bill, strongly pronounced gonys, elongated nuchal feathers, and completely webbed feet, which are classed by Boie as Sea-Terns (*Thalasseus*).

Adult male and female (Ceylon). Length 20·0 to 21·5 inches; wing 13·9 to 14·75 (average about 14·4); tail 7·0 to 8·6, fork of the tail about 4·0 deep; tarsus 1·25 to 1·35; middle toe and nail 1·3 to 1·45; bill to gape 3·4 to 3·6, at front 2·5 to 2·7. Expanse 42 to 46 inches. Females in this species are, as *a whole*, no smaller than males.

Breeding-plumage. Iris dark brown; bill murky yellow, tinged with green in parts; roof of mouth and tongue bluish; legs and feet black, with a reddish tinge, soles yellowish.

Forehead to within ¼ inch of the bill, top of the head down to a line with the lower eyelid, occiput, and a pointed crest of about 1¾ inch in length glossy black; point of the forehead, lores, face, entire neck, and under surface, with the under tail-coverts, under wing and its edge pure white; back and wing-coverts dark slate-grey, paling on the upper tail-coverts and tail, and blending into the white of the hind neck; lateral tail-feathers, which are very much attenuated, with most of the outer web white; quill-shafts white; primaries dark iron-grey, "frosted" with silvery grey when first moulted, but in old feather turning to blackish brown, the inner portions white, extending on the 1st along the edge to the tip, but running in a point into the black extremities of the rest; secondaries dark grey, with their terminal margins and inner portions white. In some examples the black forehead approaches to within 0·1 of the bill, but never touches it as in the next species.

Winter plumage. Bill greener than in summer; legs and feet pure black.

Forehead and lores white, as also the coronal feathers, the central portions of the latter being black, which gradually increases, leaving the edges and tips only of the nuchal feathers white; a black border in front of the eye, and the upper cheek and ear-covert feathers striped with the same, varying according to the individual; back and wings not so dark as in summer.

Examples shot in January in Ceylon show signs of moult in the wings and tail, so that the winter plumage is not complete until very late. The outer tail-feathers are not so pointed as in summer, when, however, they speedily become abraded after being acquired in April.

Young. I have not had an opportunity of examining a nestling of this species.

Immature, 1st plumage. Wing 12·8 inches: tail 5·5; tarsus 1·12; middle toe 1·05; bill to gape 3·0, at front 2·2. Feathers of the back and scapulars with large terminal brown spots; longer scapulars, tertials, and greater coverts brown at the tips, with a whitish margin: median wing-coverts marked with paler brown than the back; the lesser series blackish brown, edged with white; secondaries blackish terminally, the inner webs white; primaries black, tinged with grey; tail slightly paler, tipped with white; head and nape blackish brown; the forehead and front of crown whitish, spotted with brown; beneath white, striped with brown on the sides of the neck, face, and across the fore neck; the upper throat and breast unmarked. The tongue is bluish in the immature bird.

An example from Bass's Straits, Australia, younger than the above, has the same general character of plumage, the forehead being of course darker, as this becomes pale with age.

Birds in the second year show their immaturity in the dark band on the ulna adjacent to the edge of the wing. An October example in the 2nd year (female) measures—wing 14·7, bill at front 2·65.

Obs. This species has been greatly subdivided, owing to local variation in the colour of its plumage and its dimensions, a parallel to which we have in many other widely-distributed forms. Hence we have it described from the Cape as *S. bergii* by Lichtenstein, as *S. velox* from the Red Sea by Rüppell, *S. pelecanoides* from North Australia by King, and, finally, as *S. poliocercus* (its smallest form) from the south of Australia by Gould. Mr. Saunders has rendered good service in examining either the types of these and other races into which the species has been subdivided, or carefully comparing a large series of specimens, including all the representatives of the races in question, and finally coming to the conclusion that there is but one good species to be made out of them all. I have myself looked over a considerable series from various parts of the world, and I can wholly indorse his verdict. *The* main character of the species is the black cap, of similar boundary in all, and the white forehead formed by the termination of that cap at a certain distance from the bill. Even in Ceylon there is a considerable variation in size and colour; but fine specimens in good plumage are quite equal in size to those from Africa. Towards China the species begins to decrease in size, and in the south of Australia reaches its minor limit. Examples in summer plumage, in the Swinhoe collection from Amoy, measure as follows:—wing 13·1 to 13·4 inches, tail 6·9, tarsus 1·1, bill at front 2·2 to 2·4. A female from the island of Morotai, collected by Bernstein, measures—wing 13·0, bill at front 2·3, showing a decrease in the wing, but an increase (individual) in the length of the bill. Specimens of *S. poliocercus* in Mr. Saunders's collection range as low as 12·75 in the wing. Mr. Hume furnishes some very valuable data concerning the size of Indian examples; he found those he procured at the Laccadives rather smaller than those from the mainland, the wing-measurement varying from 13·5 to 13·8; that of specimens from various parts of the coast from the Persian Gulf to Tenasserim is 13·2 to 15·12, three fine examples from Astolah measuring 14·75, 14·87, 15·12 inches.

Distribution.—This fine Tern is found all round the coasts of Ceylon more or less throughout the year, being, however, most numerous on both sides of the island during the breeding-season, at which time it frequents the stretches of coast adjacent to its "colonies." They are mostly seen about the coast during stormy weather, except in the latter part of the year, when they are very abundant on the rocks near Colombo, a large proportion of the flocks seen there being composed of young birds. They appear in considerable numbers near Galle in the "Little Monsoon," or first break-up of the fine weather in April, being then driven from the sea towards the shore. During the lull that follows they again go out to sea, and do not frequent the shore in numbers until the end of May, at which time they are collecting at the breeding-"colony" on the rock near Balapitiya. In July I have seen it in the Hambantota district; and in August great numbers frequent the vicinity of the "Basses," and doubtless are the progeny of some "colony" in the vicinity. At Trincomalie they are common from September until April, but not so abundant as the next species. About the shallow waters surrounding the Jaffna islands and on the "Lake" I do not think they are, as a rule, so plentiful as on the exposed and rocky coasts of the island.

It is found on all the coast of India, but apparently is more abundant on the western side, being a common bird on the Malabar coast and near Bombay, and very abundant in the Laccadives, where Mr. Hume considers there must be a breeding-colony at Pere-Mull-Par. On the west coast it is found at Madras pretty commonly, but is met with rarely round the head of the Bay and along the coast of Tenasserim, as Mr. Hume records it only from the south of Mergui. It frequents the coast of Sindh, Kurrachee harbour, and the Gulf of Oman, breeding in immense numbers on the island of Astolah. It inhabits presumably the

Persian Gulf, and is found round the coasts of Arabia to the Red Sea, where, writes Von Heuglin, it is common, except in the northern half. It is, however, resident, says Captain Shelley, in Lower Egypt, and various naturalists have noticed it in Port Said. On the Somauli coast Mr. Heuglin found it common, and discovered it breeding not far from the shore further north, between Suakin and Massowa. Southwards it extends down the eastern side of the continent to the Cape, where it is, according to Layard, one of the commonest of Terns, breeding to the north-west of Cape Town. It is recorded from Algoa Bay and Natal, and also from Mozambique and Zambesi. Newton found it in Madagascar, Rodriguez, and also at the Seychelles. It is found in Damara Land in Walwich Bay, but does not extend further north than that latitude, being replaced on the west coast by *S. maxima*, which Captain Shelley records, in the 'Ibis,' 1872, under the name of *S. bergii*, as "being the commonest Tern at Accra and Cape-Coast Castle."

Returning to the Asiatic region, we find it common on the China coasts, breeding on Kelung Island, N. Formosa. It was obtained in the Philippines at Zamboanga by the 'Challenger' naturalists, and also in the Admiralty Islands. In the Malayan archipelago it is almost universally distributed, having been obtained in Sumatra (Lampong), Java, Borneo (Labuan), Celebes, Batchian, Gilolo, Morotai, Amboyna, Ceram, Mysol, Aru Islands, Obi, Timor, Flores, and New Guinea. In Australia it is found round the entire coast. In Torres Straits Macgillivray found it breeding in May and June; whilst on the west coast Gilbert took its eggs on Bathurst Island, where it resorts in great numbers in December. It is very abundant in Bass's Straits and off the coast of New South Wales, being found in flocks of from ten to fifty in winter, according to Gould, and breeding there in summer. It is found at Norfolk Island; and, according to Layard, it is common in New Caledonia, and distributed throughout the New Hebrides and the Fiji Islands. It is recorded by Finsch from the Friendly group and from the island of Ponapé. It has likewise been found in the Society and the Sandwich Islands, and is doubtless universally distributed throughout Polynesia.

Habits.—The Swift Tern, as it is sometimes called, is entirely a maritime species, frequenting open coasts, deep harbours and bays, and often straying many miles away from land. It confines itself, as much as possible, to rocky places, and particularly to parts of the coast where there are isolated rocks standing out a little distance from the land, on which it delights to rest when not fishing, huddling together, so that the surfaces of small rocks are completely covered by them sometimes. From these trysting-places they sally out in small parties of half a dozen to fish, and do not congregate on the wing in such numbers as the next species. They scarcely ever alight on sand, being the most rock-frequenting species we have in Ceylon. It is a powerful bird on the wing, but not any swifter than the next, and is not such a skilful "plunger," displaying less agility than its smaller ally. It appears to rest during a great portion of the day; and I am inclined to think, from the noise I used to hear at nights on the rocks opposite my quarters at Colombo, that they are about a good deal at that time, perhaps fishing when the moon is sufficiently bright to enable them to see their prey. Their note is a harsher and louder croak than that of the next species, and it is not so frequently repeated on the wing; but when there is not enough room to accommodate their numbers on a small rock there is generally a good deal of clamour going on, the latest comers, and, as usual, the worst served, attempting to settle down where it is not possible for them to do so, and flying up and circling round their more fortunate companions with loud cries. They course backwards and forwards over the same spot in search of their food, which consists entirely of fish, upon which they pounce heavily, often nearly immersing themselves in the water. Layard speaks of them at the Cape of Good Hope resorting to the craft in the harbour, and sitting on the mast-heads, along the bowsprit and taffrail as close as they can find room, knowing well that the police regulations prohibit their being shot at among the shipping.

Nidification.—Mr. Nevill, C.C.S., has taken the eggs of this Tern in June from a rocky islet, some little distance from the shore, at Balapitiya, about 20 miles north of Galle. I am not sure that this is a regular breeding-place; for in 1871, when I was at Galle, they did not appear to be breeding there, at least so far as I could judge from inquiries made. They doubtless nest annually at some spot on the south coast; and those who are interested in oology ought to make a point of discovering their colonies, one of which may be on some rocks near Hatagalla. In my notice of its distribution I have referred to several breeding-places of this species, and one of the largest of these is that on the island of Astolah, in the Gulf of Oman. Captain E. A.

Butler, 83rd Regt., visited this place in May 1877, and found the Terns breeding in groups, making no nest, not even scratching a nest-hole. "The eggs," he writes, "are laid on the bare ground, in the most open and exposed parts of the island, about 1 foot apart; and when sitting the birds seem packed together as close as possible without perhaps actually touching each other." So close are the eggs laid to one another that a lot of 47, belonging to a large group of birds, did not occupy more than 6 or 8 square feet. On retiring a little distance, after frightening the Terns from the nests, hundreds of Sooty Gulls mixed with them, and descending with the owners of the eggs, fought with them, carrying off the eggs as fast as possible and devouring them.

I have been favoured by my friend Mr. Howard Saunders with a view of a large series of the eggs taken by Captain Butler on this occasion. They are exceedingly variable, the ground-colour being pale reddish grey, dark salmon-colour, pale stone-grey, pale reddish white, and light greyish. They are of the usual shape, rather more pointed than those of many other species. Some are marked with bold hieroglyphic streaks, and others with rounded blotches of deep red-brown; others with huge blots or clouds of blackish sepia, some, again, with long bold straggly lines of the same, mixed with rather fine irregular streaks of olive-brown. The bold markings are, for the most part, at the large end, with a few scattered over the surface at the small end; the underlying coloration consists of clouds and spots of pale reddish or bluish grey; but some eggs are almost devoid of the latter. The dimensions of several are 2·37 by 1·72, 2·3 by 1·73, 2·45 by 1·67 inches. They are rather rough in texture. Eggs from the Red Sea do not differ from the above: two specimens in Mr. Dresser's collection are pointed ovals, of a rather chalky texture and stone-white ground-colour, marked throughout with blots of rich dark brown over large blotches and clouds of dark inky grey; they measure 2·17 by 1·52 and 2·21 by 1·53 inches. Another is of a buff-grey ground-colour, closely marked with large clouds of umber and olive-brown, taking a longitudinal direction, and under which there are smaller markings of dusky bluish grey; it measures 2·23 by 1·5 inches.

STERNA MEDIA.

(THE LESSER CRESTED TERN.)

Sterna media, Horsf. Trans. Linn. Soc. 1820, xiii. p. 198; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1430 (1873); Legge, Ibis, 1875, p. 408; Saunders, P. Z. S. 1876, p. 655; Dresser, B. of Eur. pts. 71, 72 (1878); Hume, Str. Feath. 1878, p. 493 (B. of Tenass.), et 1879, p. 116 (List B. of Ind.).

Sterna affinis, Rüpp. Atlas, p. 23, pl. 14 (1826).

Sterna bengalensis, Lesson, Traité d'Orn. p. 621 (1831); Hume, Str. Feath. 1873, p. 284; Legge, Ibis, 1874, p. 33.

Thalasseus torresii, Gould, P. Z. S. 1842, p. 140; id. B. of Austr. vii. pl. 25 (1848).

Thalasseus bengalensis (Lesson), Blyth, Cat. B. Mus. A. S. B. p. 291 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Jerdon, B. of Ind. iii. p. 843 (1864).

Thalasseus medius (Horsf.), Holdsw. P. Z. S. 1872, p. 482.

The Allied Tern, *The Lesser Sea-Tern*, of authors. *Toyang Kacher*, Java (Horsf.); *Abu queschesch*, Arabic (Heuglin).

Adult male and female (Ceylon). Length 14·5 to 16·75 inches (dependent on the length of the tail in the breeding-season); wing 11·3 to 12·4; tail 4·8 to 6·25 (fork 2·4 deep in longest); tarsus 1·0 to 1·1; middle toe and nail 1·1 to 1·2; bill to gape 2·6 to 3·0, at front 1·9 to 2·2.

Females average smaller than males; the size of the bill varies much in both sexes.

Iris brown; bill orange-yellow; legs and feet black, soles of toes yellowish.

Breeding-plumage (Ceylon). *Entire* forehead, lores, and head (to a line with the lower eyelid), occiput, and crest of $1\frac{1}{2}$ inch in length, glossy black; lower half of lores, face up to the eye, hind neck, and whole lower surface, including the under tail-coverts, edge of and under wing pure white, the breast in some suffused with a very slight rosy hue; interscapular region, back, tertials, wing-coverts, and tail above very pale blue-grey, blending into the white of the hind neck, the pointed lateral tail-feathers paling almost into white; primaries, when freshly moulted, with their outer webs and terminal portion "frosted" silvery grey, changing into iron-grey on the inner web next the shaft, the rest being white; secondaries a slightly deeper grey, with their inner portions and a terminal defined edging white, as in other species. Some time after moult the bloom or frosting fades entirely from the quills, and the grey portion becomes blackish.

Winter plumage. Bill in some as in summer, in others chrome-yellow, sometimes slightly tinged with green.

Forehead and lores unspotted satiny white; crown white, the feathers blackish grey in the centre; on the occiput the white decreases, and the feathers are almost entirely black, as are also the crest and a band running forward to the eye; a black border in front of the eye, and in some a few black streaks beneath it; remainder of the plumage as in the summer, but the tail and its coverts darker grey; the lateral tail-feathers not quite so long as in summer. Specimens shot in December have not quite completed their winter livery as regards tail and wings; and by the end of March many examples are to be found with black heads. The amount of black on the crown varies considerably, some examples having only the edges of the feathers white in that part. This Tern differs materially from the last in winter plumage in wanting the white edgings to the nape-feathers.

Young. The *immature* bird in first winter has the bill paler yellow than in the adult; the feet and legs sometimes spotted with yellow.—*Male* (December). Wing 11·0 inches; tarsus 1·0; tail 4·2; bill at front 1·85.

Head as in the adult in winter, but the occipital feathers not so elongated and of a brownish-black hue; scapulars, tertials, and wing-coverts brownish towards the tips, with the edges buff-grey; the feathers of the back are blue-grey, and have replaced those of the nestling-plumage; quills blackish grey, "frosted" on the outer webs, and

with the inner webs of the two first quills marked with white, as in the adult; terminal portions of the tail-feathers brown, with the extremities whitish; the least wing-coverts brown, forming a conspicuous band along the ulna.

Obs. Examples of *S. affinis* from the Red Sea are identical with Indian birds. A specimen before me measures as follows:—wing 11·4 inches; tail 4·6; tarsus 1·0; middle toe 0·8, its claw 0·3; bill to gape 2·9, at front 2·1. The tints of the upper surface are the same as in Ceylonese birds. Mr. Hume gives the dimensions of a Laccadive *female* as—length 15·0 inches; expanse 35·25; wing 11·3; tarsus 1·0; bill from gape 2·6: weight 8 oz. A *male* from the Gulf of Oman—length 16·5 inches; wing 12·25; tail 6·0; tarsus 1·1; bill to gape 2·93. The North-Australian bird, *S. torresii*, is identical with ours; but on the coasts of New Zealand and Tasmania it is replaced by another species, *S. frontalis*, Gray, which differs in having a black bill, like that of the Sandwich Tern, and the forehead, in summer plumage, is white, as in the species last noticed: a specimen before me measures—wing 10·5 inches, bill to gape 2·2. The present species is allied to the American Crested Terns, *S. elegans*, Gambel, and *S. eurygnatha*, Saunders, but is, according to Mr. Saunders, smaller, and has the gonys not so long, and the rump and tail much darker.

As the Sandwich Tern, *S. cantiaca*, Gm., has been referred to above, it may be well for me to notice it here, as it may some day occur in Ceylon, being very abundant off the coast of Sindh. It may be distinguished from all other Terns inhabiting this region by its long, slender, black, yellow-tipped bill. In winter the forehead and front of crown are satiny white, and the occiput and nape marked as in the Large Crested Tern; the upper surface is very pale blue-grey, the primaries light silver-grey, the tail and its coverts almost white. A specimen in my collection measures:—wing 11·4 inches; tail 5·0; tarsus 1·1; bill to gape 2·95. The outer web is considerably excised. Bill black to within 0·4 inch of the tip, which is yellow; legs and feet black. In summer the head and forehead are black down to the bill.

Distribution.—This Tern is the most numerous species on our coasts, and is perhaps equal in point of numbers with the Marsh-Tern. In the north of the island it is, together with the Gull-billed Tern, the most abundant of its family. It is common on the west coast from September until May, frequenting the rocks at Colombo, and fishing much in the freshwater lakes round Slave Island. It is also numerous on the brackish lake at Negombo. By the middle of May it disappears from this part of the island, many birds being in summer plumage and many in winter at that time. In the north-east it appears in August, and by the end of October great numbers are about the coasts, more being seen in windy rainy weather near the shore than when it is fine. It leaves this part also in May. During the month of March I found it very numerous on the Jaffna Lake and at Manaar, as also about Karativoe and the adjoining islets. As regards the south-eastern region, the locality where Terns are most abundant, its distribution is singular, for, like the Gull-billed Tern, numbers are to be seen there in non-breeding plumage throughout the summer. Examples shot then, as a matter of course, showed no signs of fecundity. There appears to be no other solution of the abundance of non-breeding Terns in this portion of Ceylon than in the hypothesis that they are birds bred south of the Line in the opposite season to the breeding-time in India, and which come to Ceylon when the cool-season birds leave to rear their young in localities north of the island. In August great numbers of this species are to be seen out at the Basses, which is the great fishing-ground of the Terns on the south-east coast.

At the Andamans it has not been observed, and it is only recorded by Mr. Davison from one locality (Camorta) in the Nicobars. In Sumatra it has been procured at the south-east corner (Lampong) and also in other districts by Müller; whilst in Java it was obtained by Horsfield, and first described by him from that island. On the west side of India Mr. Hume met with it in the Laccadives, at Pere-Mull-Par and Cherbaniani. On the coasts of the mainland Jerdon says it is perhaps more abundant than the last species, "especially about the backwaters of Madras and the Malabar coast." Higher up the Bay on the east coast it is rarer; and on the other side Blyth is the only naturalist who has recorded it from the shores of Tenasserim. It is common about Bombay and on the coast of Sindh in harbours and backwaters; from the Indus to Gwader it is very abundant, says Mr. Hume, being found there in vast flocks with the Sandwich Tern. Thence westwards it will in all probability occur in tolerable numbers in the Persian Gulf and round the coast of Arabia, where Von Heuglin says it can scarcely be called a resident, though it is common in the Gulf of Aden. In the Red Sea it is resident, but confined chiefly to the southern portion, being only found occasionally on the Egyptian part of the coast and on the lagoons of the delta. Captain Shelley, however, remarks that it is

resident in Lower Egypt; Mr. Stafford Allen has found it at Alexandria in June; and Mr. Dresser has eggs taken by this gentleman on the coasts of the Red Sea. It extends southwards to Zanzibar, and has also been procured in the Comoro Islands, at Mayotte, and in Madagascar.

Returning now to the Mediterranean, we find it occurring along the south coast, breeding near Tunis, and straggling as far west as Gibraltar, where Col. Irby says it occurs in spring. Near Tangier, Favier states that it is occasionally met with; but further south, near Larache, it is more common during the months of September, October, and November. At the eastern end of the Mediterranean it occurs in the Greek archipelago; and Canon Tristram records it from Caiffa Bay, on the shores of Palestine.

In conclusion, to trace out its distribution beyond Java, I find that it has been procured in Celebes, but is doubtfully assigned to Java by Salvadori. Still further to the south, it is found on the north coast of Australia, where Gould records it as abundant in the harbour of Port Essington and on the adjacent islands. Mr. Ramsay further records it from Port Darwin, Cape York, and the Gulf of Carpentaria. It is noteworthy that it is not found on the China coasts.

Habits.—This elegant Tern, like the last species, frequents bays, harbours, and the open coast, wandering in fine weather far out to sea; it is also found on salt lagoons, estuaries, and freshwater lakes in the vicinity of the sea, in which latter it feeds abundantly on small fish, pouncing on them with unerring aim, and very rarely rising from the water without a fish in its bill. Its prey is always seized across the body, and then tossed head foremost into the mouth as it rises again; and so active is it on the wing, that I have frequently seen it drop a fish while adjusting it in its bill and easily catch it again before it reached the water. It will often descend like an arrow, and then, suddenly checking its progress just above the water, it will spread out its wings and "delve up" the fish which has happened to be close to the surface. It is a pretty sight to see several hundred of these Terns hovering over a crowd of fish, hemmed in in a large sein-net, plunging rapidly on their imprisoned prey, and rising each time with a fish in their bills. Their favourite food on the east coast is the sardine (*Sardinella neohowii*), on which it will feed till its entire stomach and throat are crammed. When pouncing on a shoal of these fish it entirely immerses itself in the water, shaking the wet from its plumage with a flutter of its wings as it rises again, immediately plunging anew. Von Heuglin states that it dives from the surface of the water; but during my eight years' acquaintance with it I never saw it once alight on the surface of the water; and the same has been my experience of the last species. It rests for the most part while digesting its food upon rocks, and very seldom is seen upon sand; but I have occasionally seen one perched on the telegraph-wire crossing the Colombo Lake. It is one of the noisiest of Terns, perpetually giving out its harsh note while fishing; and when a large flock are heard in the distance the sound produced is something like the creaking of a gate. Their ordinary progress on the wing is very rapid, and they make good headway against a storm of wind and rain, frequently shaking off the wet from their backs by a tremulous motion of the body.

Nidification.—As yet this species has not been found nesting in Ceylon or in India; and the nearest breeding-place I am acquainted with is that on the island of Arabi, in the Persian Gulf, where Captain E. A. Butler found it nesting in July 1878. In the Dahlak archipelago, in the Red Sea, Von Heuglin found them nidificating from June until August. There they prefer, he says, low sandy places, where a scanty vegetation, consisting of soda-plants, is growing; and there numerous nests are placed close together, consisting merely of a depression in the sand. The eggs are usually two in number, and the birds incubate chiefly in the cool of the evening and during the night. The birds defend their nests with great courage, confronting any intruder with loud cries and blows of their pinions.

Eggs of this species from the Persian Gulf vary in ground-colour from warm reddish or pale salmon-red to stone-white, between which extremes there are many tints of buff. They vary much in the character of their markings, but not in the tints of the same. Some have huge clouds of blackish sepia, softened at the edges into a paler tint, and occasionally running into bluish grey, which underlies the dark colour in large blotches or clouds. Other eggs are similarly marked with smaller blotches, and some are sparingly covered throughout with small spots of deep red-brown. Dimensions of different specimens are 2·11 by 1·41, 1·92 by 1·34, and 2·1 by 1·38 inches.

STERNA DOUGALLI.

(THE ROSEATE TERN.)

Sterna dougalli, Mont. Orn. Dict. Suppl. (1813); Gould, B. of Eur. pl. 418 (1832); Legge, Str. Feath. 1875, p. 376, et 1876, p. 246; Saunders, P. Z. S. 1876, p. 652; Dresser, B. of Eur. pt. 54 (1876); Hume, Str. Feath. 1878 (B. of Tenass.), p. 492, et 1879 (List Ind. B.), p. 116.

Sterna paradisea, Keys. & Blas. Wirbelth. Eur. p. 97 (1840); Blyth, Cat. B. Mus. A. S. B. p. 292 (1849); Jerdon, B. of Ind. iii. p. 840 (1864).

Sterna gracilis, Gould, P. Z. S. 1847, p. 222; id. B. of Austr. vii. pl. 27 (1848); Holdsw. P. Z. S. 1872, p. 481 (first record from Ceylon); Hume, Str. Feath. 1874, p. 317.

Sternula korustes, Hume, Str. Feath. 1874, p. 318.

Sterne de Dougall, French; *Paradies-Meer-Schwalbe*, German; *Graceful Tern*, Gould.

Adult male (Ceylon, June). Length 14·6 to 15·8 inches; wing 8·4 to 9·0, expanse 25·0 to 26·8; tail 6·5 to 7·7, depth of fork 4·0 to 4·5, lateral feathers in finest specimen 2·65 longer than the adjacent; tarsus 0·8 to 0·92; middle toe 0·7 to 0·75, claw (straight) 0·24, inner edge pectinated slightly; bill at front 1·23 to 1·4, to gape 1·8 to 1·95.

The lateral tail-feathers are very much attennated in this species, extending in fine specimens 2·5 inches beyond the closed wing.

(18th June.) Iris brown; bill orange on the basal half, remainder of upper mandible blackish, of lower paler or brownish; legs and feet coral-red; claws red, tips dusky.

(30th June.) Bill jet-black throughout, claws the same.

American examples shot in July, in Mr. Dresser's collection, and a Port-Blair specimen (20th May) have the bill black, except round the base, where it is yellow. A September specimen (Elizabeth Island) has it entirely black.

Forehead, with the upper half of the lores, crown, nape, and upper part of hind neck glossy black, the boundary-line passing from the nostril along by the under edge of the eyelid (which, however, is white) and over the ear-coverts to the nape; hind neck just beneath the termination of the crest white, changing imperceptibly into the delicate pearly grey of the back, wings, rump, and tail, which latter fades again into white on the lateral feathers; primaries dark grey, thickly "frosted" with white on all the outer webs but that of the 1st, the inner portions of the inner webs white, *continued as a broad edge to the tips*; tips of the secondaries white; primary-shafts white to the tips; underparts suffused with delicate rosy white, tinged with pale grey on the flanks; axillaries pure white, but the under wing tinged with rose-colour. In examples not so far advanced towards breeding-plumage this rosy colour is not so pronounced, showing that it increases until the bill is at its blackest, and the individual has assumed its perfect nuptial attire.

Winter plumage. Bill red, tipped with black more or less; underparts white; the forehead, lores, and front of crown white; occiput and nape with the centre of the feathers black and the margins white.

Young, about three months old. Wing 8·2 inches; tail 4·2; bill to gape 2·6.

Bill black; legs and feet brown.

Head above mouse-colour, darkening on the nape, and spotted on the crown with black; a spot in front of the eye and a patch behind it black; cheeks just beneath the eye striped with black; hind neck and interscapulary region finely stippled with brown and buff; uppermost scapulars more coarsely marked with the same; longer scapulars and tertials grey, passing into buff at the tips, and marked with blackish-brown centres and broad stripes running round inside the edge of the feathers; lesser wing-coverts blackish grey, tipped with white; remainder pale blue-grey; the greater coverts and the secondaries tipped white, the latter very broadly, the adjacent colour being blue-grey, passing into white at the base and on the outer web; quills as in the adult, with broader white tips; all but the outer tail-feathers with dark markings near the tips.

Obs. Measurements of birds from other parts of the world are:—(Massachusetts, Mus. Dresser) wing 9·1 to 9·2 inches; tail 7·8 to 8·5, outer feathers 4·8 to 5·6 longer than the central pair; tarsus 0·7; middle toe 0·7; bill to gape 2·0, at front 1·5: (Port Blair, Mus. Dresser) wing 8·4; tail 6·0; tarsus 0·7: (Andamans, *Hume*) wing 8·5; tail nearly 7·0, extending an inch (only) beyond the closed wing; tarsus 0·75; bill 1·45 at front.

Colour of bill. Mr. Hume's experience at the Andamans of the change in the colour of the bill is exactly the reverse of what mine is. He says the bills are blackish in April, changing to orange-red in May at the base; in June the terminal parts are dusky blackish, and in July the whole bill is orange-red. Now at the beginning of June (1875), when these Terns appeared at Trincomalie, all that I could see had reddish bills; and what I shot with such bills had abraded tails and but little rosy colour on the breast. At the end of June many that I saw on the wing had black bills, and what I shot with such bills were in magnificent and perfect plumage. The numbers I saw and those I shot may not have been sufficient to give me a true insight into the question, and therefore I will not assume that my opinion is the correct one, but merely call the attention of ornithologists to these facts with a view to adducing more evidence to show whether or not the colour of the bill is quite an untrustworthy character. It is noteworthy that the nearer we get to Australia the redder the bills appear to be. Gould's *Sterna gracilis* is founded mainly on the red bill as distinguished from the black one in European specimens. The series I procured in Ceylon exhibited a peculiar feature in having acquired the new primaries before the rectrices; the opposite is the case with all other Terns I have met with in that island.

Distribution.—In his catalogue of Ceylonese birds Mr. Holdsworth notices the capture of some Terns at Colombo in July 1869, one of which Mr. Howard Saunders identified as *S. gracilis*. In May and June 1875 large numbers visited the coast at Trincomalie and remained until the beginning of July, when they disappeared; and as Captain Wimberley found them breeding at Port Blair, South Andaman, in June, the Ceylonese visitants probably moved on there and bred in other parts of the islands. In 1873 the same gentleman procured it in the Andamans, and Mr. Davison sent a specimen thence to Mr. Hume. It appears therefore that it visits the Bay of Bengal at irregular times. It ranges south to Australia, chiefly frequenting the west, north, and north-east coasts down to the latitude of Wide Bay. At Noumea, New Caledonia, Layard has procured it, as also at Ansevata, where he found it breeding on New-Year's day. Mr. Gilbert met with it on the west coast of Australia, at the Houtmann's Abrolhos, in great numbers, and found it breeding there in the month of November. It probably occurs on the coasts of Sumatra and Java, though it has not yet been noticed in either of those islands. It is very rare on the coasts of India. Mr. Hume records it from one locality (Laynah creek) on the Tenasserim coast, where it occurred accidentally on one occasion. Mons. Dussumier procured an example on the Bengal coast; and at the mouth of the Indus Captain Butler was recently informed that a rosy-tinted Tern had been seen, which must have been this species. Between India and Europe it does not appear to have been noticed; and on the latter continent its distribution is by no means universal. I find no record of its occurrence at the eastern end of the Mediterranean, nor in Egypt or the Red Sea. It is very rare in Greece, and, according to Salvadori, has only once occurred in Italy, in Liguria, in June 1822. It has been shot in the Balearic Islands, but is not recorded from Spain. It is rare on the coasts of France, Holland, and the Baltic, and does not range to the north beyond lat. 57°, according to Mr. Saunders. It is perhaps more common in the British Isles than in most parts of the continent, for it breeds in Scotland and Ireland. In the former country it was first discovered by Dr. McDougall on the Cumbrey Islands in the Firth of Clyde, and named after this gentleman by Colonel Montagu. It breeds in Kilbrannan Sound, on Loch Lomond, in Morayshire, on Foulney Island, on the coasts of Cornwall, and in Ireland, according to Thompson, on Mew Island. On the east coasts of North America it is more common than in Europe, breeding from Massachusetts to Florida, including the island of Bermuda. It has been met with in the West Indies, and Mr. Salvin found it on the coast of British Honduras. Finally, in the Atlantic it occurs in the Azores, for Mr. DuCane Godman saw it at Fayal. It does not frequent the west coast of Africa; but it has been shot at the Cape of Good Hope and in Natal; and it is said to be found, writes Mr. Dresser, at Rodriguez.

Habits.—This lovely Tern, which may easily be distinguished from all others on the wing by its extremely elegant form and lengthened tail-feathers, is purely a sea-coast species, rarely being seen away from salt water, and seldom even frequenting backwaters and salt lagoons near the sea. It is not a swift bird in its ordinary flight; but nevertheless turns and twists about with the greatest ease and grace, and plunges sharply upon its prey. While proceeding along with light though measured strokes of its wings over the breaking surf, it will suddenly stop, wheel round, point its bill downwards, and seeing a fish will fall upon it like an arrow, its elegant form making but little splash in the foaming waters. At other times it will sweep gracefully down in a curve, and delve up the "fry" from the surface. Its long "streamers" are carried close together, so that the bird

appears on the wing to have an attenuated Parrakeet-like tail. It constantly utters a monosyllabic and not unmusical piping note; but when a pair are together they give out a harsh *crake*, very unlike the ordinary call. This Tern is decidedly a shy bird, for when numbers were fishing off the fort at Trincomalie with the Gull-billed and Common Tern they seldom came within shot of my position; and when I met with them flying along the surf they kept well out from the beach, except at dusk, when they would pass close to me.

Nidification.—The breeding-season in the northern hemisphere lasts from May till July; but on the coasts of Australia and in the Pacific, as we have seen, this Tern nests in the opposite season of the year. According to one authority (Captain Walker, of Belmont, Ireland) the nest is a little hollow in the sand, surrounded by a small hoop of about 3 inches in diameter, made of grass and neatly put together. No mention, however, of this curious construction is made by Dr. Heiberg, who found it breeding in Denmark, and concerning whose discovery Mr. Dresser publishes details from a correspondent in Copenhagen.

The eggs are said to be two in number; and a series I have examined are rather large for the bird, pointed ovals, and slightly rough in texture. Some are rather stumpy at the small end. They vary considerably in ground-colour, some being creamy white, others buff-brown and pale olivaceous stone. The markings are scanty in some and rather thickly distributed throughout the surface in others: one specimen before me has a zone of handsome blackish-sepia blotches round the obtuse end, under which are clouds of dark inky grey of two shades; another is rather closely marked with small blots of rich brown of two shades over dark inky-grey blots; a third has a few openly-distributed small spots of pale brown over larger, more numerous, and almost equally prominent blotches of bluish grey. The dimensions of several specimens in Mr. Dresser's collection are 1·64 by 1·19, 1·72 by 1·18, 1·68 by 1·19, and 1·68 by 1·08 inch.

STERNA FULIGINOSA.

(THE SOOTY TERN.)

Sterna fuliginosa, Gm. Syst. Nat. i. p. 605 (1788); Temm. & Schl. Faun. Jap. p. 133, pl. 89 (1842); Finsch & Hartl. Orn. Centralpolyn. p. 225 (1867); Sperling, Ibis, 1868, p. 286; Saunders, P. Z. S. 1876, p. 666, et 1877, p. 796; Hume, Str. Feath. 1876, p. 477; Dresser, B. of Eur. pt. 61, 62 (1877); Hume, Str. Feath. 1879, p. 116 (List B. of Ind.).

Onychoprion fuliginosus (Gm.), Gould, B. of Austr. vii. p. 32 (1848); Sclater & Salvin, P. Z. S. 1871, p. 572; Hume, Str. Feath. 1873, p. 140 (first record from Ceylon); Salvadori, Uccelli di Borneo, p. 373 (1874).

Hydrochelidon infuscata (Licht.), Heuglin, Orn. N.Ost-Afr. ii. p. 1457 (1873).

Haliplana fuliginosa (Gm.), David & Oust. Ois. de la Chine, p. 528 (1877).

Wide-awake of sailors.

Characteristics. *Bill from gape not less than 2·2 inches; black loral stripe oblique; inner and middle toes fully webbed. Young brown beneath.*

Adult male and female (Atlantic). Wing 11·2 to 11·8 inches; tail 5·5 to 7·0, according to length of outer tail-feather, which is much attenuated; tarsus 0·8 to 0·95; middle toe 0·8, its claw 0·38, web of inner and middle extending to $\frac{1}{10}$ from the tip of the sole of the latter: bill to gape 2·3.

Adult male and female (Laccadives). Length 16·1 to 17·75 inches; wing 10·65 to 11·8, expanse 32·5 to 35·25; tarsus 0·9 to 0·93; bill from gape 2·3 to 2·4, at front 1·6 to 1·7. Weight of the largest specimen 8 oz. (*Hume.*)

Iris deep brown, almost black; bill, legs, and feet black.

Breeding-plumage (Ascension). Head and nape deep glossy black, the colour extending to within 0·3 inch of the base of the bill, and covering the sides of the head and upper part of the hind neck down to the level of the lower eyelid; forehead and upper part of the lores white, narrowing to a point above the centre of the eye, and leaving a border of black $\frac{1}{20}$ inch wide, which descends as a broad *oblique stripe* to the gape; entire upper surface and wings black-brown, darkening into black on the least wing-coverts, which are set off by a white border round the edge of the wing; outer web of lateral tail-feathers white, the inner greyish white, passing into brown at some distance from the tip; entire under surface white, sullied slightly with grey on the breast and abdomen.

Young, nestling in down (Ascension). Above mingled grey and brown, the tips of the down being of the latter colour, which is most conspicuous on the sides of the back, forming two stripes with a white interspace; forehead brown; head whitish, mingled with jet-black down, the whole being stiff and pointed, and not "decomposed," as on the back; wings as the back; beneath uniform whitish.

The young vary: two specimens from Houtmann's Abrolhos do not possess the white patch on the centre of the back, and one is much more closely mottled and altogether darker than the other.

Almost completely fledged bird. "Entire upper surface, sides of the neck and breast, and upper abdomen a deep sooty brown, almost black on the head and scapulars; all the scapulars and largest tertials tipped with white, and those of the interscapulary region and all the wing- and upper tail-coverts tipped with rufescent buff." (*Hume*, Laccadives.)

Immature, first plumage (Brit. Mus.). Entirely brown, paler beneath and of a chocolate tint, the bases of the feathers white; feathers of the head crossed with minute bars of fulvous; interscapulary region barred with buff-white, the markings increasing in width towards the rump and confined to the tips of the feathers; scapulars and tertials broadly tipped with white; wing-coverts less so, the least series blackish brown and unmarked; secondaries and tail-feathers tipped with dull white. Wing 8·6 inches. A *younger* bird, just fledged, is barred above in the same way, but has the throat whitish, striped with blackish.

Immature, about one year old (Ceylon, June and August. 2 examples). Wing 11·3 inches; tail 4·7 to 5·6, depth of fork 2·0; tarsus 0·85 to 0·9; middle toe 0·8 to 0·85; bill at front 1·6 to 1·7, to gape 2·3 to 2·35.

Iris dusky brown; bill black; legs and feet black.

Forehead greyish; entire upper surface black, with a greenish gloss in places; feathers of back edged with white; under surface brown, mixed with whitish chiefly on the throat and belly; flanks more uniformly dark than the breast.

Another example (Mount Lavinia, June) has the forehead whitish, with blackish spots or "points;" chin and gorge the same; throat brownish, lower parts pale whity brown; under tail-coverts sullied white.

Obs. This species has frequently been confounded with the next; but the characters which I have given above will, in addition to its larger-sized bill, serve at once to identify it, should any of my readers procure specimens in Ceylon. Mr. Saunders was the first naturalist to point out the important difference in the feet of the two species.

Distribution.—The Sooty Tern has only recently been added to the avifauna of Ceylon. During the south-west monsoon of 1873 three examples were met with by Mr. Hart, the taxidermist of the Museum, on the little tank of Boralesgamuwa, about nine miles from Colombo, and one was shot which I sent to Mr. Hume for his inspection. Subsequently another specimen was captured in a net by fishermen at Mount Lavinia in August 1874, and a third was secured exhausted on the rocks at the same place in June 1876. I have not heard of any further occurrences of the species in the island, but it is no doubt much less rare than these few instances of its capture would lead one to infer; for among the thousands of its near ally, the Brown-winged Tern, which are seen on the coasts there must be a certain proportion of the present species.

Though Jerdon omitted this Tern from the Indian list, Mr. Hume says it is not uncommon right up the west coast of the peninsula, and northwards to the Mekran coast. He has seen it from near Panwell, in the Bombay Harbour, also from Tutul between Surat and Bombay, and also from Minicoy. In February 1875 he found it breeding in enormous numbers at the Cherbaniani reef in the Laccadives, and from the stock there raised doubtless come the individuals which occur on the west coast of Ceylon. It occurs throughout the Indian Ocean, having been met with at various parts on the east coast of Africa, and at the islands of Madagascar, Rodriguez, and Mauritius. Von Heuglin observed it on the Somauli coast, and Messrs. Finsch and Hartlaub in the northern half of the Red Sea. It is abundant on the west coast of Australia, breeding in great numbers in December at the Houtmann's Abrolhos, near Perth. Mr. Ramsay records it from the South Australian, Victorian, and New South Wales coasts, and from Rockingham Bay, Cape York, and Port Darwin. Macgillivray found it breeding in Torres Straits in May and June; and this difference in the time of its nesting on the Australian coasts is very noteworthy. It is doubtless an inhabitant of the seas surrounding many of the Pacific islands, as I find it recorded from New Caledonia, from the Samoa Islands, the Marquesas, the Rosa and Honden Islands, and from Ponape in the Seniavin group. In the Malay archipelago it has been obtained, writes Salvadori, off the coasts of Sumatra and Borneo; and northwards it occurs along the China coasts to Japan, where, however, it appears to be very rare. Père David says that he has seen it in the interior of China "going west, doubtless towards the great lakes of Central Asia;" but there appears to be some mistake in this naturalist's identification, as this truly oceanic bird could not have been seen on its way to Central Asia.

Turning now towards the Atlantic, we find it recorded from the Gold Coast and from Senegal; and at St. Helena, where I have seen it, it is tolerably plentiful. At Ascension it breeds in great numbers at certain spots in the island termed "Wide-awake Fairs." They arrive for breeding purposes about October, and do not leave sometimes until May, in which month I saw great numbers there in 1877. Their visits, however, are not regular, for Captain Sperling found them breeding in June. It is an occasional straggler as far north as Europe. Mr. Dresser enumerates four instances of its occurrence, two of which were in England, viz. one at Burton-on-Trent, October 1852, the other at Wallingford, Berks, June 1869; a third was obtained at Magdeburg, in Germany, and a fourth at Verdun, in France. It is common on the east coast of America, being most abundant in tropical parts. Mr. Dresser met with it in Texas, and it is very numerous on the Florida Keys. It has been obtained at Bermuda; and in the West Indies it is found on the Cuban and Jamaican coasts, and breeds at St. Thomas's. On the western side it wanders as far south as Chili, and northwards to the Aleutian Islands.

Habits.—This Tern is exclusively an oceanic species, never straying inland, except during the prevalence of strong winds. It may be seen at great distances from the land, though it is not so much at home as the Noddies in mid-ocean, and when seen there has the appearance not so much of wandering about as of making its way to some distant land, and merely flying round the ship, on the look-out for food thrown overboard. When I have met with it fishing it has generally been within twenty miles of the land. Being a bird of very powerful flight it no doubt travels long distances in search of food, particularly when it has young to feed; for I find it noticed by Mr. Penrose, in his paper "On the Birds of Ascension," that one was caught with a fish in its bill which was unknown in those waters. I have observed it sweeping down rapidly to the surface of the water and dipping up its prey as it were, but I have not noticed it pouncing. It adroitly twists and turns and contrives often to avoid the attacks of its enemy, the Frigate-Bird, which I have seen dashing headlong at it in order to rob it of its well-earned food. It has a loud scream, which I omitted to syllabize when listening to it, but which Audubon likens to the syllables *ooee oo-ee*; and he says that when seized or wounded it utters a plaintive cry, differing from the ordinary note. Its food consists of fish, cephalopods, floating animalculæ, &c., besides which it will pick up various substances thrown overboard from ships.

Nidification.—The Wide-awake breeds, as a rule, in vast colonies on small islands or reefs, many such breeding-places having been discovered within the last fifty years. The following are known to me; and as far as I am able I have given the dates, from which it appears that the breeding-time varies at different places from December until August:—Cherbaniani reef, Laccadives (February); Houtmann's Abrolbos, W. Australia (December); Torres Straits (May and June); Raines Island Barrier Reef (August); Ascension (December and June); St. Thomas's, West Indies; Florida Keys. The eggs are laid in a depression in the sand scratched by the bird, and often near the shelter of a bush; they vary from one to three in number, and while the bird is sitting on them she will suffer herself to be taken by hand, hissing and biting at the intruder. Mr. Hume gives an interesting account of his visit to Cherbaniani, and states that the ground literally swarmed with young ones, which ran about between his feet in such a manner that it was difficult to avoid treading on them. On taking some young back to the reef on the following day, the parents, amidst thousands of birds, immediately found out their lost offspring! The eggs of the Sooty Tern vary much, both in ground-colour and marking: some are almost pure white, and many different tints are observable between that and the pale salmon-colour of others. They are, as a rule, broad, rather pointed, ovals, the shell moderately smooth and with scarcely any gloss. The markings are very handsome, the whitest eggs being covered with openly distributed roundish blotches of rich brownish red, or clouded with the same round the obtuse end, there being but few small spots on this latter type, but numerous clouds of purplish grey underlying the dark markings. Some white eggs are blotched throughout with obliquely-directed blots of a redder tint running into purplish grey. In others the blotches take a transverse direction: one specimen, in the fine series before me from Ascension Island, is smeared all over with light reddish washed-out blotches, mingled with streaks and scratches of the same, with large underlying clouds of bluish grey. The dimensions of various specimens are as follows:—2·19 by 1·43, 1·97 by 1·46, 2·17 by 1·39, 2·03 by 1·35, 1·84 by 1·35, and 2·05 by 1·39 inches. The variation in shape will be thus observed; some specimens are rather blunt at the small end.

I here subjoin some extracts from the accounts given by Audubon and Captain Sperling of the interesting breeding-places of this bird. The latter writes, concerning Ascension:—"Leaving Comfortless Cove about the middle of the day, I walked over two dreary miles of cinders and ashes, uncheered by a symptom of vegetation, before I noticed flocks of Terns converging from various parts of the ocean to a spot apparently about a mile in front of me; but as yet I observed nothing of the 'fair;' at length, on turning slightly to the left and surmounting a low ridge, the whole scene was disclosed. A gradual incline of a quarter of a mile terminated in a plain of ten or fifteen acres in extent, which was literally covered with the birds. The plain was surrounded by low mountains, except on the side on which we stood; and being entirely sheltered from the wind, its heat under the full blaze of a tropical sun was very oppressive. No description can give an adequate idea of the effect produced by the thousands upon thousands of these wild sea-birds floating and screaming over this arid cinder-bed, the eggs and young scattered so thickly on the ground that in some instances it was impossible to avoid crushing them and the bleached bones of dead birds distributed in all directions. During our short walk down the incline, large flocks of parent birds hovered over our heads, and assailed us with plaintive cries,

regardless of our sticks, with which we might have killed any number of them; but their beautiful pure dark and white plumage and graceful motions caused it to appear almost a sin to knock any of them down. On arriving within the precincts of the breeding-grounds their numbers increased; large flocks were arriving in endless succession from seaward; clouds of birds rose from the ground, and, joining those already attending us, their wheelings and gyrations almost made us giddy. I sat down on a lump of cinder; and the society, being at length convinced that my policy was not aggressive, went on with the ordinary routine of incubation. There were young of all sizes, from the little callow ones just hatched to the nearly fledged birds that fluttered and crawled like young pigeons. There were also lots of eggs exposed on the bare ground; but in most instances the old bird sat on its solitary treasure, hissing defiance as I approached, and fighting manfully if I attempted to remove it."

Audubon's charming account of his visit to Florida Keys displays so much of the wonderful powers of observation for which that great naturalist was so celebrated, that I cannot forbear giving the following extract from the 'Birds of America,' vii. p. 252:—"Here and there, in numerous places within twenty yards of me, females, having their complement of eggs, alighted, and quietly commenced the labour of incubation. Now and then a male bird also settled close by and immediately disgorged a small fish within the reach of the female. After some curious reciprocal nods of their heads, which were doubtless intended as marks of affection, the caterer would fly off. Several individuals which had not commenced laying their eggs, I saw scratch the sand with their feet, in the manner of the common Fowl while searching for food. In the course of this operation they frequently seated themselves in the shallow basin to try how it fitted their form, or find out what was still wanted to ensure their comfort. Not the least resemblance of a quarrel did I observe between any two of these interesting creatures; indeed they all appeared as if happy members of a single family; and, as if to gratify my utmost wishes, a few of them went through the process of courtship in my presence. The male birds frequently threw their heads over their backs, as it were, in the manner of several species of Gulls; they also swelled out their throats, walked round the females, and ended in uttering a soft puffing sound as they caressed them. Then the pair for a moment or two walked round each other, and at length rose on wing and soon disappeared. It was curious to observe their actions whenever a large party landed on the island. All those not engaged in incubation would immediately rise in the air and scream aloud; those on the ground would then join them as quickly as they could, and the whole, forming a vast mass with a broad extended front, would, as it were, charge us, pass over for fifty yards or so, then suddenly wheel round, and again renew their attack. This they would repeat six or eight times in succession. When the sailors, at our desire, all shouted as loud as they could, the phalanx would for an instant become perfectly silent, as if to gather our meaning; but the next moment, like a huge wave breaking on the beach, it would rush forward with deafening noise."

STERNA ANÆSTHETA.

(THE BROWN-WINGED TERN.)

*Sterna anæthetus**, Scop. Del. Flor. et Faun. Ins. i. p. 92 (1786), *ex* Sonnerat.
Sterna panayensis, Gm. Syst. Nat. i. p. 607 (1788).
Onychoprion panayana (Lath.), *apud* Gould, B. of Austr. vii. pl. 33 (1848).
Onychoprion anasthætus (Scop.), Blyth, Cat. B. Mus. A. S. B. p. 293 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271; Jerdon, B. of Ind. iii. p. 844 (1864); Hume, Str. Feath. 1874, p. 320; Salvadori, Uccelli di Born. p. 374 (1874).
Hydrochelidon anæsthetus, Scop., Heuglin, Orn. N.Ost-Afr. ii. p. 1453 (1873).
Sterna anæstheta, Scop., Legge, Str. Feath. 1875, p. 377; Hume, ibid. 1876, p. 474; Saunders, P. Z. S. 1876, p. 664; Hume, Str. Feath. 1879, p. 116 (List B. of Ind.).
Sterna fuliginosa, Gm. *apud* Legge, Str. Feath. 1875, p. 378.
Hirondelle de mer de l'île de Panay, Sonn. Voy. N. Guin. pl. 86 (1776); *Panayan Tern*, Lath.; *Brown-winged Noddy* of some.
Liniya, Sinhalese.

Characteristics. *Loral stripe horizontal from eye to bill; back paler than the wings; inner web of foot not extending beyond the last joint of middle toe. Young white beneath.*

Adult male and female (Ceylon, breeding-plumage). Length 14·0 to 15·3 inches; wing 9·8 to 10·5, expanse 29·0 to 30·0; tail 6·3 to 7·0, outer tail-feathers attenuated and sometimes 2·0 longer than adjacent pair; depth of fork in such 4·5; tarsus 0·7 to 0·8; middle toe and claw 1·08 to 1·2; bill to gape 1·9 to 2·1, at front 1·6 to 1·7.
Iris deep brown; bill black, extreme tip pale horny; legs and feet black.
Forehead and a broad stripe extending over each eye white, the frontal portion being narrower than in the last species; centre of the forehead, crown, occiput, and nape glossy black, descending behind the eye to a level with its lower edge; a broad black band from the eye *straight forward* to the bill, and not taking an oblique direction down to the gape; hind neck greyish white, tinged on the lower part with ashy, and passing into the smoke-brown of the mantle, scapulars, and upper tail-coverts and tail, all of which parts are pervaded with an ashy hue, varying according to the individual; wing-coverts and tertials darker smoke-brown than the back, edge of the wing white; primaries with their coverts and secondaries black-brown, the shafts chocolate-brown, but white beneath; lateral tail-feathers white, with the exception of the extreme tip and the terminal portion of the inner web; beneath white, the chest, breast, flanks, and abdomen more or less tinged with ashy grey; axillaries and under wing pure white.

Winter plumage (August, Ceylon). Lores, forehead, front of crown, and over the eye white; feathers of the crown and occiput edged with white, the centres blackish brown; nape-feathers finely tipped with white; a black spot in front of the eye, before which the feathers forming the stripe in summer are greyish; hind neck slaty, with the margins of the feathers greyish; feathers of the back, rump, and upper tail-coverts tipped indistinctly with slaty grey; outer webs of the lateral tail-feathers dark for $2\frac{1}{2}$ inches or more from the tip; under surface pure white. In some examples with unmarked wing-coverts the mantle-feathers are very broadly tipped with white; these are probably birds in their second winter.
Specimens shot in April and May are in change, acquiring the black loral and coronal feathers. Many are, however, in full breeding-plumage by the end of April.

Young (October and November, Colombo). Length 12·0 to 13·5 inches; wing 9·8 to 10·0; tail 5·0 to 5·5; tarsus 0·8; middle toe 0·9, claw (straight) 0·3; bill to gape 2·0 to 2·15.
Iris brown; bill black, inside of mouth white; legs and feet livid brown, in some bluish brown.

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* The omission of the "*s*" is doubtless a printer's error, and should not be followed now.

About four months old (October). Head much as in the adult in winter, but the lores darker, and the dark feathers encroaching on the forehead and tipped with buff-white, and the nuchal feathers broadly tipped; just behind the eye uniform black, passing under the eye; hind neck grey; mantle and rump broadly tipped with white, passing into the brown with an ochraceous hue; scapulars more deeply tipped still, and the ochraceous division more noticeable; wing-coverts less conspicuously tipped with white; tail tipped as the scapulars, the outer feathers entirely brown. Some examples have very little white on the forehead. Birds a month older than the above show less of the ochreous-brown coloration, and the white tippings are to some extent worn off; but no rule can be established, as seldom two birds are alike, particularly about the head.

Obs. The extent of the white over the eye varies: in some specimens it is produced quite beyond the posterior edge of the eyelid. There is also no little variation in the coloration of the hind neck, some specimens being much paler than others, and occasionally quite white. A very fine female in breeding-plumage, from Paternoster Island, measures:—length 15·5 inches; tail 8·4, outer tail-feathers 5·0 longer than the central; bill to gape 2·0; the inner web joins the middle toe at the centre of the 2nd phalange, this being the most deeply excised foot I have met with in any specimen examined.

Sterna albigena, Licht., an interesting, slender-billed, grey-plumaged Tern, inhabiting the Red Sea and northern part of the Indian Ocean, has recently been killed at the Laccadives, and therefore may occur in Ceylon at some future time. Mr. Hume gives the dimensions of a male as:—length 14·5 inches, wing 9·9, tail 6·5, tarsus 0·77, middle toe and claw 1·04, bill to gape 2·15. In *summer* the bill is coral-red, blackish at the tips and base of culmen; legs and feet bright coral-red; iris brown; wings exceeding the tail by 3 lines (*Heuglin*). Above bluish grey; front and sides of the neck, breast, and abdomen purplish grey; chin and upper part of throat whitish; lores and beneath the eye snowy white. In *winter* the bill is reddish black, and the legs and feet Indian red. Back, scapulars, and tail dark French grey, and the breast and abdomen dusky bluish grey; lores and forehead white, and the crown whitish, spotted with black (*Hume*). The red legs are a good distinguishing character.

Distribution.—The Panayan Tern is exceedingly numerous on the coasts of Ceylon at certain seasons of the year. It appears on the west coast, when there is a strong wind blowing on shore, from May till October, and again in April and May at the commencement of the south-west monsoon. At these periods it may be seen in the Colombo Roads and in the inner harbour flying about in search of garbage, and alighting on the little wooden buoys used by the native vessels. In August 1874 great numbers visited the port; and in October 1876 it was more numerous still, the majority of the birds being quite young. In the former year I saw great numbers at the Basses, and the following day (in August) a good many in the Batticaloa Roads. At Trincomalie I have chiefly noticed it in December and in April and May, at which dates it used to appear for a few days and then move away. At Galle it was numerous in October and November in 1878, but was not much seen in the daytime, making itself known by its incessant cries at night. Layard appears only to have met with three specimens at Pt. Pedro while out at sea dredging; and Mr. Holdsworth does not seem to have seen it at all on the Pearl Banks of Aripu. It must also be admitted that, though abundant on the coasts in some seasons, its visits are uncertain, for in 1868–69–70 I saw nothing of it at Colombo. It most probably wanders over the Indian Ocean in vast flocks, visiting various localities *en route*.

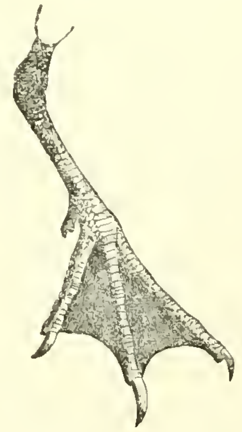
Like the last, this species has a very wide intertropical range, but does not seem to be found in central-Atlantic localities, like the Sooty Tern; for though it is recorded from Honduras and the West Indies, and from the west coast of Africa, I do not find any mention of its occurrence at Ascension or other Atlantic islands; and it has not strayed into Europe, like the latter bird. In the Indian Ocean, from the east coast of Africa, Madagascar, Mauritius, Réunion, and Seychelles, across to Western Australia and northward to Bombay and the Bay of Bengal, it is perhaps more abundant than in any other seas. It breeds in great numbers on the Vingorla rocks off the Bombay coast, and thence no doubt visits Ceylon. It has been met with between Bombay and Kurrachee, and in the Bay of Bengal it occurs on all the islands in the monsoons. In the Mergui archipelago it is believed to have been seen, but nowhere else on the coast of Tenasserim. In the Malay islands it is recorded from Sumatra, Java, Borneo (Pontianak), Moluccas, and Celebes; and from the Philippines it was made known by Sonnerat. It has been met with on the south coast of New Guinea, in Torres Straits, at Port Darwin, Cape York, Rockingham Bay, down the whole of the east coast to Victoria, and thence to South Australia; and on the coasts of Western Australia it breeds at the Houtmann's Abrolhos. It is found at some of the Pacific islands, including the Sandwich, also the Fiji group, where Layard has

recently procured it, and extends northward to Japan, where it is apparently a rare straggler. It has been found on the Pacific coasts of America; and there is a specimen in the Norwich Museum from the Aleutians, alluded to by Von Heuglin.

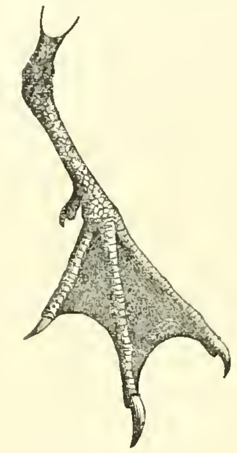
Habits.—The Brown-winged Tern is purely an oceanic species, and is a bird of buoyant and rapid, though not very powerful, flight; for it is invariably driven from its maritime haunts to the shore in high winds, and is often in such an exhausted state that it may be taken by hand from the rigging of vessels, from the gunwales of boats, and from any prominent object on piers and wharves, where it will alight, seemingly quite regardless of its natural enemy, man. I have taken it myself from the awning of a steamer in the Colombo Roads, and have seen it captured while sitting on the gunwale of a canoe in the harbour. Mr. Hume testifies to its being frequently thus taken on ships in Indian waters; and probably, as is the case in Ceylon, the specimens thus procured are immature. When caught their stomachs are often quite empty. While taking its food or capturing small fish, such as sardines &c., it flies along the water, almost touching the surface, and darts down its bill as it proceeds; at times it hovers over a fish, and, descending rapidly to the water, takes it up as described, but does not pounce on it. On stormy nights great numbers are attracted by the lights of maritime towns, and pass many hours in wheeling round and round in the air, uttering their far-sounding notes. These sounds I heard at Galle, Trincomalie, and Colombo for several years before I identified the bird, as while on the wing by day it is silent; but one evening, on the new breakwater at Colombo, I was attracted by the familiar and unidentified note, and found a young bird sitting on a balk of timber screaming lustily, perhaps to its fellows who were flying about in the harbour. This note may be syllabized by *ker krēe, tree trēe*, which, when uttered by a number of birds together, has a peculiarly consonant and grating sound. It feeds much on garbage and refuse thrown out of ships. Von Heuglin writes that it avoids flat coral islands, and frequents precipitous islands and cliffs; and further notices that on moonlight nights it is about until very late.

Nidification.—The last-mentioned author found this species breeding on cliffs near Djedah, on the Arabian coast of the Red Sea, in June. Each clutch consisted of two eggs, laid on the bare cliff, often between stones. Mr. Hume found thousands of addled eggs in February on the Vingorla rocks amongst the grass, together with numbers of dried-up mummies of old and young birds, which seems to indicate that the birds, which evidently breed during the height of the monsoon in June, must have been driven away from their stronghold by boisterous winds, leaving their offspring and eggs to the mercy of the weather. Eggs of this species from the Red Sea, in the collection of Mr. Howard Saunders, are pale reddish grey, pinkish, and greyish white in ground-colour, oval in shape, and marked with small spots and specks of light red, brownish red, or dark red-brown over blotches of light bluish and purplish grey; one egg is marked with large blotches of pale pinkish grey. Examples measure 1·75 by 1·28 and 1·75 by 1·17 inch.

The accompanying woodcuts, for the use of which I am (with the consent of Mr. Howard Saunders) indebted to the Zoological Society, show the difference in the feet of the last two species.



Foot of *Sterna fuliginosa*.



Foot of *Sterna anæstheta*.

Genus ANOUS.

Bill long and slender, but with the gonys well marked. Wings long. The *tail cuneate.* Feet fully webbed.

ANOUS STOLIDUS.

(THE COMMON NODDY.)

Sterna stolida, Linn. Syst. Nat. i. p. 227 (1766).

Sterna senex, Leach in Tuckey's Expedition to Congo, App. p. 408 (1818).

Anous stolidus (Linn.), Gould, B. of Austr. vii. pl. 34 (1848); Blyth, Cat. B. Mus. A. S. B. p. 293 (1849); Jerdon, B. of Ind. iii. p. 845 (1864); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1459 (1873); Salvadori, Uccelli di Born. p. 379 (1874); Legge, Str. Feath. 1876, p. 247 (first record from Ceylon); Saunders, P. Z. S. 1876, p. 669; Hume, Str. Feath. 1876, p. 478, et 1879 (List B. of Ind.), p. 116.

Adult (Ceylon). Wing 10·75 inches; tail 6·0; tarsus 1·0; middle toe 1·5; bill at front 1·75, to gape 2·1.

Adult male and female (Laccadives). Length 15·62 to 16·5 inches; wing 9·9 to 10·8; tail 5·8 to 6·35; tarsus 0·99 to 1·05; bill at front 1·65 to 1·76, to gape 2·25 to 2·4 (*Hume*). The smaller dimensions relate to females.—*Adults* (Atlantic, Indian, and Pacific oceans; Mus. Saunders). Wing 10·2 to 11·4 inches; tail 6·0 to 7·0; tarsus 0·97 to 1·02; middle toe (without claw) 1·27; bill at front 1·54 to 1·8. *Female* (Mus. Dresser). Wing 10·5; tarsus 1·0; middle toe 1·3, its claw 0·3; bill to gape 2·15, at front 1·7.

(Laccadives, February.) Iris deep brown; bill black, orange at the gape; legs and feet dusky vinous purple, webs paler; claws black (*Hume*). In a specimen shot in June in Ceylon the bill was entirely black, the legs and feet dark fleshy brown, and the webs pale fleshy.

Adult. Forehead and *front of crown* white, passing gradually into greyish white on the crown and thence into very pale grey on the nape, which darkens imperceptibly into the smoky brown of the neck and upper surface; neck and throat slightly pervaded with grey, and the entire under surface a somewhat more earthy or chestnut colour than the upper; face round the gape slightly darker than the throat, and a black spot just in front of the eye, the white of the forehead terminating abruptly against this spot and the brown of the lores in front of it; centre of the upper eyelid and all the lower half white; lesser wing-coverts darker than the rest; primaries and secondaries brownish black; tail not so dark, but black at the tips of the feathers; under wing-coverts very dark smoky grey.

The forehead and front of crown are whiter in some specimens than in others, the older birds being probably the whiter; the whole head and nape are in such specimens proportionately pale; the upper surface in a series of specimens before me varies from dark brown to reddish brown. Specimens from the Atlantic seem to be darker than those from other parts. The extent of the dark spot in front of the eye varies, running forward in some as a line bordering the white of the forehead nearly to the bill.

Young, almost fledged (Mus. Saunders). Feathers dark smoky brown throughout, without any pale tippings; throat, nape, breast, and belly in white down; the forehead as dark as the crown.

Immature (Cocos Islands). Forehead completely brown; back and wing-coverts brown; throat darker brown; under surface pale smoky brown, fading to greyish on the belly. In an example from the Pacific in moult from the first plumage the forehead is white, not grading into the *dark colour of the crown*, but sharply defined against it, and dark feathers are mingled with the white.

Obs. The stout bill and short gonys serve to distinguish this species from its allies.

The Noddy inhabiting the Indian Ocean, which comes nearest to the present bird, is *A. tenuirostris*, Temm. It

differs in its more slender bill, with the gonys longer than in *A. stolidus*; the forehead and crown are whitish grey, there being no difference in hue, whereas in the Common Noddy the crown is not so white as the forehead; again, the whitish hue of the forehead descends upon the lores, leaving merely a black border in front of the eye; the hind neck is pale grey, slightly darker than the crown; the chin blackish brown; the bill varies from 1·5 to 1·7 at front, and the wing from 8 to 9 inches. *A. leucocapillus*, Gould, appears to wander north from Australia into the Indian Ocean. It is a species with a white forehead and head, and very dark, almost black, lores; the dark brown of the ear-coverts, sides of neck, and nape is sharply defined against the white of the head; the wing is slightly longer than in *A. tenuirostris*, 9·0 to 9·5 inches; the bill slender, but with a shorter gonys than in the last-named bird.

Distribution.—This widely distributed Noddy has only recently been added to the avifauna of Ceylon. On the occasion of its visit to the island, which was on the 5th of June, 1876, a flock of four individuals were seen flying along the Galle-face beach in the morning by the taxidermist of the Colombo Museum, who shot one of them, which is now preserved in the collection of that institution. As the species breeds in the Laccadives it is singular that it is not seen on the west coast during strong westerly winds, the only explanation being that before the S.W. monsoon sets in in May the birds have left the breeding-place and are scattered over the Indian Ocean. I have seen Noddies on more than one occasion a day or two's sail south of Point Galle, which probably belonged to this species, and Père David met with thousands not far from Ceylon in July 1870. The Common Noddy has a very wide range, occurring right round the world in tropical waters, and straying as far north in the Atlantic as the British Isles, in the Pacific up to Formosa, and in the Indian Ocean as high as the Gulf of Oman and the Bay of Bengal, in which latter waters it is common, being found as far north as the Sandheads. It is met with occasionally at the Andamans, and on the opposite side of the peninsula affects some of the coral islands of the Laccadive group in great numbers, breeding at the Cherbaniani reef; further north Captain Butler saw it along the Mekran coast. In the Red Sea it ranges as far north as the tropic, beyond which Heuglin states that he has not seen it. Off the Somauli coast, according to this author, the numbers which frequent rocky islands and cliffs is quite incredible. Along the tropical shores of Eastern Africa it is common, extending to the Seychelles, Madagascar, Mauritius, Réunion, and Rodriguez. On the eastern confines of the Indian Ocean it is abundant along the shores of Australia, and ranges round the southern coasts to South Australia and Victoria, although it has not been noticed on the Tasmanian coasts. In the north of the continent it is recorded from Port Darwin, the Gulf of Carpentaria, and Cape York, extending from the latter all down the east coast. At Raine's Island the naturalists of the 'Challenger' found it breeding, and also met it abundantly at the Admiralty Islands. I find it is not uncommon in the Pelew Islands, and from the Philippines it has been once recorded. Elsewhere it has been met with at the Caroline Islands, at Ponape in the Seniavin group, in New Caledonia, Tahiti, and many other Polynesian islands. It is found also at the Galapagos Islands and on the tropical portions of both coasts of the continent of America. In the Atlantic it has been procured at Ascension, where it breeds in limited numbers, also at St. Helena and Tristan d'Acunha, which is its furthest limit towards the south—its most northerly range being the vicinity of the British Isles, in the avifauna of which it is included.

Habits.—Dwelling almost entirely upon the ocean, over whose wide expanse they roam in search of subsistence, the Noddies resemble the Petrels more than the Terns in their mode of life. They are birds of swift and enduring flight, but keep, as a rule, near the surface of the water, though they do not "shear" over the waves in the same manner as the Shearwaters. They fly like other Terns, but when they espy their food they settle on the water like Petrels to pick it up. This species feeds on mollusks, oily matter, garbage, and other substances which it finds floating on the sea. I have never heard their note, though I have often seen them, and I imagine that, except in the breeding-season, the Noddies are very silent birds.

Nidification.—The Common Noddy breeds in large colonies, laying at various times of the year, according to season, in the part of the world it resorts to. The nearest breeding-place to Ceylon is in the Laccadives, where Mr. Hume found it nesting in great numbers at the Cherbaniani reef in February. In the southern hemisphere it breeds at the Houtmann's Abrolhos and at Raine's Island in August, and also in the same

month at St. Paul's rocks in the Atlantic. At Ascension, however, and in British Honduras it breeds in the early part of the year.

I append here the following account by Mr. Gilbert, taken from Mr. Gould's work, of the breeding of this species at the Houtmann's Abrolhos, a group of islets lying off the west coast of Australia in lat. 28° S.:—"It lays its eggs in November and December, on a nest constructed of seaweed, about 6 inches in diameter and varying in height from 4 to 8 inches, but without any thing like regularity of form; the top is nearly flat, there being but a very slight hollow to prevent their single egg from rolling off. The nests are so completely plastered with the excrement of the bird, that at first sight they appear to be entirely formed of that material; they are either placed on the ground in a clear open space, or on the tops of the thick scrub, over those of the *Onychoprion fuliginosus*, the two species incubating together with the most perfect harmony, and the bushes presenting a mottled appearance from the great numbers of both species perched on the top . . . . On walking among the nests I was surprised to observe the pertinacity with which the birds kept their post; in fact they would not remove from off the egg or young, but would suffer themselves to be trodden upon or taken off with the hand; and so thickly were the nests placed, that it was no easy matter to avoid crushing either eggs or birds at every step." Mr. Gilbert says that numbers of the young are killed by a small lizard abundant on the island, and which extracts the brains and vertebral marrow, so that not more than one out of every twenty hatched reaches maturity.

The eggs of this Noddy are a delicate reddish white, rather rough in texture and pointed ovals in shape, very sparingly marked with small specks of brownish red round the larger end, or with a few larger blots of the same sparingly scattered over the whole surface; beneath these markings are faint spots of delicate bluish grey. Some examples in a series before me, belonging to Mr. Dresser, and taken in British Honduras, measure 1·87 by 1·35, 2·05 by 1·41, and 1·96 by 1·36 inch.

There are many other breeding-places of this Noddy throughout the world; some are in the Pacific, two of which, at Niuafon and Eua Islands in the Friendly group, are cited by Dr. O. Finsch. It probably breeds at Rodriguez, and also, according to Heuglin, in the Red Sea.

GAVIÆ.

LARIDÆ.

Subfam. LARINÆ.

Bill stout, of moderate length; tip of the upper mandible curved; the gonys short and angulated; nostrils oblong and pervious. Wings when closed exceeding the tail. Tertials not exceeding the 6th primary. Tail short and even, or slightly cuneate. Tarsus longer than the middle toe and claw; the anterior scutes transverse and broad; toes fully webbed; hind toe rudimentary in one genus.

With a change of plumage in summer, acquired by a moult, chiefly on the head. Of natatorial habit.

Genus LARUS.

Characters of bill and wings as in the subfamily. Tail short and even at the tip; webs complete; hind toe present and not rudimentary.

LARUS ICHTHYAËTUS.

(THE GREAT BLACK-HEADED GULL.)

Larus ichthyaëtus, Pallas, It. ii. App. no. 27 (1776); Blyth, Cat. B. Mus. A. S. B. p. 288 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Shelley, B. of Egypt, p. 307, pl. 13 (1872); Dresser, B. of Europe, pt. 18 (1873); Hume, Str. Feath. 1873, p. 276, et 1879, p. 115 (List B. of Ind.); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1401 (1873); Legge, Str. Feath. 1875, p. 375; Saunders, P. Z. S. 1878, p. 198.

Kroikocephalus ichthyætus (Pall.), Jerdon, B. of Ind. iii. p. 831 (1864).

Croicocephalus ichthyaëtus (Pall.), Holdsw. P. Z. S. 1872, p. 480.

Adult (Caspian). Wing 18·3 inches; tail 6·5; tarsus 3·0; middle toe and claw 3·4; bill to gape 3·5.
(Volga.) Wing 19·5 inches; tail 8·6; tarsus 3·1; middle toe 2·3, its claw 0·5; bill to gape 4·0, depth 0·9.

Adult male (Sindh). "Length 29·95 inches; wing 19·5; tail 7·5; tarsus 3·2; middle toe and claw 2·55; bill from gape 3·8; weight 2 lb. Wing in 12 males 19·0 to 20·0; in 5 females 18·5 to 18·9." (*Hume.*)

Breeding-plumage. Iris brown; gape and eyelids vermilion; bill rich orange or wax-yellow, with a black bar across both mandibles between the tip and the gonys; "legs and feet rich yellow, with a greenish tinge" (*Tristram*).

Entire head and throat to the level of just beneath the nape glossy black, sharply defined all round against the white of the neck and entire under surface, the tail and its coverts; back, interscapulary region, and wing-coverts delicate blue-grey; scapulars and tertials tipped with white; primaries and their coverts white, the 1st quill with a black edge to within $2\frac{1}{2}$ inches of the tip, adjacent to which is a black band across the inner web; at the same position there is a black band across the next four quills, more extensive on the outer web than the inner; 6th primary with a black mark on the inner web near the tip.

In specimens which are probably very old the edge only of the outer web of the 1st primary is black.

Winter plumage. Bill yellower than in summer, the terminal portion orange-red.

Head, face, and throat white, a black bordering in front of the eye; nape and sides of the head behind the eye marked with dusky grey streaks.

The summer plumage is donned very early in the season. Mr. Hume writes that specimens shot in Sindh in the latter half of January had white throats, and some of them slightly blackish-mottled caps; but others killed at Muscat in the middle of February "were in the fullest breeding-plumage, the whole head and neck all round being velvet-black."

Young, in down (Volga: coll. Saunders). Bill black, with the tip yellow; legs and feet brown.

Entire upper surface dingy white, tinged with fulvous; throat tinged with grey; under surface white.

Plumage of first winter (Ceylon). Head and all beneath white, with a dark spot in front of the eye; the hind neck and back, with the bases of the feathers, pale, the central portions pale earthy brown, and the tips fulvous: scapulars ochraceous brown, with fulvous-white tips; lesser wing-coverts dark grey-brown; median coverts brown, paling into ochraceous brown, and thence into greyish at the margins; greater series ash-brown, darker in the centre, and with whitish margins; primaries and their coverts blackish brown, paling to whitish at the bases of the inner webs, with the tips of the shorter feathers white; secondaries glossy umber-brown, the major portion of the inner webs, the tips for about half an inch, and the terminal portion of the edge of the outer webs white; sides of rump, upper tail-coverts, and two thirds of the tail from the base white, the extreme tips of all the feathers white; under tail-coverts with a black bar $\frac{3}{4}$ inch from the tip, reduced on the lateral feathers to an oval spot on the outer web; under wing brown along the edge, the median series of feathers spotted with the same.

Bill dark brown, paling behind the nostril and at the base of the lower mandible; legs and feet dusky yellow.

In the second year, judging from a specimen before me, killed in Ceylon while moulting, the hind neck is spotted with

dark ashy grey, passing on the lower part into ashy brown, overspreading the feathers to the edges, which are ashy grey; mingled with these are the earthy-brown feathers of the first plumage, and a portion of the mantle consists of the adult bluish-slaty feathers; the wing-coverts are dark; but in other specimens which I have examined in this stage they are less brown, the median series consisting of slaty feathers; the tail-band is not so broad, and the under tail-coverts are almost entirely white, with one or two dark patches only on the longer feathers. Wing 17·75 inches; tail 6·6; tarsus 2·7; middle toe and claw 2·45; bill to gape 3·1, height at gonys 0·68.

In the third year probably the adult plumage would be acquired.

Distribution.—This species, which is the largest of the Black-headed Gulls, is, so far as has been observed, only an occasional cool-weather visitant to the shores of Ceylon; but it is not improbable that stray individuals wander yearly thus far south. Layard met with two specimens at Pt. Pedro, after a severe storm, on the 11th November, 1851; but Mr. Holdsworth does not seem to have noticed it during his sojourn in the north of the island. I saw a single bird at Galle during the cool season of 1870–71; and in November 1874 a young bird was shot at Mount Lavinia by Surgeon Keith, whilst at the same time a pair were killed near Jaffna by Mr. Clarke, of the Forest Conservancy Department, one of these being the specimen alluded to above. On the 13th of March, 1876, a flock of five flew over my canoe whilst crossing the south bar of the Manaar channel; and in November of that year I observed a young bird flying past the Galle Buck at Colombo; and a few days afterwards I saw several more on the Colombo roads. It is evident, therefore, that not a few birds frequent the west coast of Ceylon during the season of migration; and are most likely all immature examples, which, as a rule, wander further south than adults.

Although it frequents the east coast of the Indian peninsula up to the latitude of the Hooghly, which it ascends, according to Jerdon, it is not found at any of the islands of the Bay; nor did Mr. Hume meet with it at the Laccadives, though it is not uncommon higher up the west coast than the latitude of these islands. Jerdon observed it at Madras, and Blyth records it from Chaibassa. Mr. Hume states that it is common in the cool season up the Bhurumpooter to Assam, on the Ganges as high as Monghyr, and on the Indus to Sukker, and that in October and March they may be seen on all the great rivers of Northern India almost to the foot of the hills, going probably from and to their breeding-places. On the Muncher Lake in Sindh he found it abundant, and also met it at the Sambhur Lake; he likewise constantly met with it at Kurrachee and along the Sindh and Mekran coasts, as well as at Muscat. The central habitat of this species lies, apparently, between the coasts of Sindh and the Caspian Sea, including an area of territory stretching to the south-east and consisting of Egypt and Nubia, where it is far from uncommon, frequenting both the shores of the Red Sea and the interior of the country as high up the Nile as El Kab, being also found on the Fayoom (*Shelley*). From this its regular domain it strays westward to the Greek archipelago, Hungary, and Switzerland, and has once occurred in Great Britain, in June 1859, when it was shot by a fisherman off Exmouth. It is reported to have been obtained at Yeddo by Commodore Perry's expedition; but Mr. Saunders is of opinion that the birds in question, which were immature, may have been the Herring-Gull; to which I may add that it is not recorded by Messrs. Blakiston and Pryer from Japan. In Palestine it is common in spring on the Sea of Galilee, where Canon Tristram met with it in March, and observed that it disappeared then from the country to breed. It is very abundant in the breeding-season on the Caspian and the Volga, whence many specimens are sent to England.

Habits.—This fine bird has been rightly called by many authors a "magnificent Sea-Gull." The purity of its plumage, its conspicuous black hood, its splendid eye, and its stately flight combine to place it in the foremost ranks of the Laridæ. It is in Asia what the splendid Pacific Gull is in the Australian seas, except that the latter, though slightly smaller, is a still nobler bird in its bearing and flight. The Great Black-headed Gull makes its appearance on the coast of Ceylon after or during storms, probably frequenting in fine weather the upper part of the Bay of Manaar, together with the still water in Palk's Straits, whence it is driven towards land by the heavy north and north-west winds which occasionally blow at the latter end of the year. At such times it is to be seen making its way along the coast just outside the breakers with measured strokes of its ample wings, and generally flying rather high. In the winter season it is a very silent bird; but in the

breeding-time it has, according to Pallas, a hoarse Raven-like call like *kori, kori,* which it constantly utters on the wing. Canon Tristram, who speaks of it as a "royal Sea-Gull," writes that on the Sea of Galilee, where it is abundant in March, it used to pass and repass up and down its short length, "making the circuit of the lake close to the edge, and always within shot, as though to keep himself in exercise." In Sindh, where numbers of these birds frequent the Muncher Lake, Mr. Hume noticed that they passed much of their time resting on the water. It feeds upon fish, upon which it plunges, and, according to Von Heuglin, upon garbage (flesh and bones) thrown out from ships, also upon locusts, crabs, and occasionally on reptiles, birds, and small mammals—partaking, therefore, of the voracious nature of all large Gulls.

Nidification.—The great breeding-haunts of this Gull are the shores of the Caspian Sea, the delta of the Volga, and certain lakes in the surrounding region. It is said to breed in colonies, its favourite locality being the islands along the east coast of the Caspian. Its eggs are laid on the bare sand, and are usually two in number, the time of their incubation being in June. In a fine series, in the possession of Mr. Howard Saunders, from the Volga and Caspian, which I have examined, the ground-colour varies from a pale stone-grey to stone, intermediate types having an olivaceous or a brownish hue. They vary in shape from a rounded oval, somewhat stumpy at the large end, to a lengthened pointed oval; one specimen is very broad and short; the markings consist of large blotches and clouds of blackish sepia, in one specimen collected chiefly at the large end, in others they are smaller and more evenly distributed over the whole surface; beneath these darker markings are rather large blotches and small spots of bluish grey in some, and purplish grey in others. In size they vary from 3·25 by 2·14 inches to 2·97 by 2·02 and 2·84 by 2·13.

LARUS BRUNNEICEPHALUS.

(THE BROWN-HOODED GULL.)

Larus brunneicephalus, Jerdon, Madr. Journ. 1840, xii. p. 225; Butler & Hume, Str. Feath. 1876, pp. 31, 32; Saunders, P. Z. S. 1878, p. 197; Hume, Str. Feath. 1878, p. 491 (B. of Tenass.), et 1879, p. 115 (List B. of Ind).

Larus brunnicephalus, Jerdon, Blyth, Cat. B. Mus. A. S. B. p. 289 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270.

Xema bruneicephalus (Jerdon), Kelaart, Prodromus, Cat. p. 137 (1832).

Xema brunnicephala, Jerdon, B. of Ind. iii. p. 832 (1864); Holdsw. P. Z. S. 1872, p. 480; Hume, Lahore to Yarkand, p. 300, pl. 32 (1873); Scully, Str. Feath. 1876, p. 203.

Xema brunneicephalum (Jerd.), Legge, Ibis, 1874, p. 32.

Ghorki, Turki (Scully); *Kadal Kuruvi*, Sea-bird, also *Pullu*, Wormpicker.

Adult male and female (Ceylon). Length 16·5 to 17·7 inches; wing 12·5 to 13·9, reaching 1·50 beyond tail; tail 5·0 to 5·6; tarsus 1·9 to 2·1; middle toe and nail 1·8 to 1·9; bill to gape 2·2 to 2·4.

Iris white, in some, however, with traces of the immature "brown;" bill coral-red, brownish at the tips and the margins adjacent dusky; eyelid red; inside of mouth bright red; legs and feet coral-red, the webs brownish red, claws blackish.

Winter plumage. Head, upper part of hind neck, upper tail-coverts, tail, and entire lower plumage white; occiput and nape with the tips of the feathers dusky in places; a brown spot in front of the eye and one at the tips of the ear-coverts; back and wings very pale blue-grey, palest on the back, and fading gradually on the lower hind neck into the white of the upper portion; terminal part of the first 6 or 7 primaries black; their bases white, gradually increasing towards the innermost, almost the whole of the outer web of the 1st being black; a white spot near the tips of the first two, and sometimes one at the extremity of the 6th or 7th; primary-coverts and winglet white, with usually a black edging or mark on the longer of the winglet-feathers. In perfect adults there is frequently a small grey spot or mark on many of the tail-feathers, where the inner edge of the immature band would come. The streaks on the nape are variable in extent, but the occiput is scarcely ever pure white, there being nearly always a dusky mark where the brown edge of the dark hood comes in summer.

Summer plumage. Entire head and upper throat dark brown, intensifying at the lower edge of the hood, which encircles the neck just below the termination of the auricular winter spot; rest of plumage as in winter. This dress is acquired as early as the beginning of March in Ceylon, when I have observed specimens with perfect dark hoods at Jaffna; some examples are to be seen in November with partially dark heads.

Young. The nestling of this Gull has not, so far as I am aware, been described.

Immature, 1st winter (Ceylon). Wing 12·0 to 13·0 inches.

Iris hazel-brown at first, afterwards mottled with white in the second year; bill yellowish red, blackish at the tips; legs and feet fleshy yellow or reddish yellow, the joints and webs dusky.

(December.) Head and face whitish, mingled with brown; tips of the hind neck and back-feathers brown; scapulars, wing-coverts, and tertials brown, with fulvous-grey edgings; winglet, primaries, and secondaries blackish brown, the white portions of the base of the primaries much as in the adult, but less on the inner webs; the white spot on the first two primaries wanting; tips of the winglet-feathers, shorter primaries, and the secondaries white; outer webs of primary-coverts black, except at the tip; a broad black-brown subterminal band across the tail; under wing-coverts brownish at the tips.

I have been unable to procure an example in younger plumage than the above, which is the dress worn by young birds on their arrival in Ceylon. The adult plumage with the tail pure white is not acquired until the 3rd year; the next stage to the above is with the back and scapulars French grey as in the adult, the lesser and median wing-coverts brown, with slaty edges, the greater series blue-grey, like the scapulars. The tail-band is the last imma-

ture character to disappear, traces of it remaining in the form of spots on some of the feathers, the remainder being pure white.

Obs. Examples from the Irrawaddy delta are recorded by Dr. Armstrong as measuring:—Length 17·0 to 18·2 inches; wing 12·4 to 13·0, expanse 38·75 to 44·25; tail 4·8 to 5·2; tarsus 1·75 to 2·0; bill from gape 2·15 to 2·25.

I notice here the beautiful *L. gelastes*, Licht., the Slender-billed Gull, which is an inhabitant of the region lying between the Mediterranean and the north-west coast of India, and which might perhaps, at some future time, occur in Ceylon. It is remarkable for the delicate pink coloration of the upper tail-coverts, neck, and under surface, is a little smaller than the subject of the present article—wing (♂) 11·7 to 12·2, (♀) 10·8 to 11·0, bill from gape 2·4 to 2·6—and has the bill blackish red and the legs and feet deep red; the mantle and wings are delicate French grey, and the 1st primary all white, except the tip and the outer web, and the next three with a successively broader tip and a dark band on the inner web.

Distribution.—This handsome Gull, which is a winter visitor to Ceylon, is very abundant in the north of the island and for a considerable distance down the east and west coasts, beyond which it strays south in limited numbers. It appears about Trincomalie during the month of October, and in November is very numerous, collecting in large flocks, chiefly composed of young birds, in the bays near the fort, when the annual sea-fishing at that season is being carried on. From this time until March they are not uncommon about the salt lakes and on the open shore between Trincomalie and Jaffna. They are found in small numbers along the east coast to Batticaloa, and probably extend to the Hambantota district, but I have not noticed them there. At Galle an occasional straggler is seen generally from January until March. In December and March I have seen it about Colombo roads, at the latter date always on its way north. Higher up, on the west coast, it is found in numbers in Kalpitiya Bay and about Karativoe Island, north of which it is

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Subfam. STERCORARIINÆ.

Bill with the base covered by a cere, hooked at the tip, rather stout and short; nostrils placed in front of the cere. Wings long and pointed. Tail moderate. Legs longer than in the *Larinæ*. Claws hooked.

Genus STERCORARIUS.

Bill covered for two thirds of its length by a smooth cere, flattened somewhat at the base; nostrils narrow and oblique, opening in front of and beneath the cere; tip hooked, but not elevated; gonys short and straight. Wing with the 1st quill much longer than the 2nd. Tail with the centre feathers exceeding the rest; of 12 feathers. Tarsus much longer than the middle toe, covered in front with stout scales; feet fully webbed; claws hooked; hind toe very small.

STERCORARIUS ANTARCTICUS.

(THE ANTARCTIC SKUA.)

Lestris antarcticus, Less. Traité d'Orn. p. 616 (1831).

Lestris catarrhactes (Linn.), Hutton, Ibis, 1865, p. 277.

Stercorarius antarcticus (Less.), Gray, Gen. B. iii. p. 653 (1845); Buller, B. of New Zeal. p. 267 (1873); Saunders, P. Z. S. 1876, p. 321.

Cape Hen of sailors, also *Sea-Hen* (Layard).

Adult (Campbell Island, Brit. Mus.). Wing 17·0 inches; tail 6·5; tarsus 3·2; middle toe (without claw) 3·0; bill to gape 2·5, height at base 1·0. "Length 24·0" (*Macgillivray* fide *Layard*).

Iris dark brown; bill brownish black; legs and feet black.

(Campbell Island.) General colour glossy wood-brown, dark on the head and paler on the neck and under surface,

common, frequenting the flats beyond the Manaar channel and the coast thence on to Jaffna in numbers. In March 1876 I saw many birds with dark hoods in the latter neighbourhood; and these doubtless were on the point of leaving for their breeding-grounds.

It is a very abundant bird on the coasts of India, and in the northern parts ascends the large rivers, such as the Ganges, Brahmapootra, Indus, &c., far into the interior, likewise affecting fresh- and salt-water lakes widely removed from the sea. At the Sambhur Lake, "the water of which," writes Mr. Hume, "is often nearly saturated brine, and where it is difficult to guess what they find to eat, Brown-headed Gulls are seen throughout the cold season in vast numbers." On the Sindh coast it is not common, though it is found more or less plentifully throughout most of the surrounding north-western region at one locality, in which (the Kunkrowlee Lake in Rajpootana) Mr. Hume observed it in numbers in the cold season. It does not appear to extend westwards up the Gulf of Oman, being there replaced by the Sooty Gull; but in the breeding-season moves to the north-east, through Kashmir towards Thibet, for Dr. Henderson found it abundantly in July near the Pangong Lake, where it was breeding near a stream in the Chagra valley; north of this region still, Dr. Scully observed it in November and December at Kashgar, and again in January near Sughlak, which proves that it does not altogether forsake its breeding-haunts in the winter. Turning eastward, to complete my notice of its range in India, it is stated to be common on the Hooghly, in Furreedpore, and throughout the region at the head of the Bay of Bengal, swarming at the mouth of the Rangoon river (*Armstrong*), not uncommon in the winter on the Sittang (*Oates*), and also along the coast of Tenasserim, and inland up the creeks as far south as Tonka (*Hume*). From this region it migrates northwards into Mongolia, where Prjevalsky met with it on Lake Dalai-nor during its migration north from the middle of March to the middle of April; on other lakes it was scarce. He states that they breed plentifully on the lakes of the Hoang-ho valley, and that the earliest migrants appeared at Koko-nor on the 5th of March. Père David likewise met with it frequently in Mongolia and also in China. It has been obtained in Persia; but Swinhoe

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and passing into dark sepia-brown on the back, scapulars, and wing-coverts; neck-feathers with fine light-brown shaft-streaks; the scapulars with brownish-grey central spots at the tips; the edges of the wing-coverts slightly paler than the centre of the feathers; primaries black towards the tips, and white thence to the base; the outer web of the 1st quill wholly black; secondaries white at the base; tail black-brown, primary and tail-feather shafts white; tail beneath pale at the base.

Young: nestling. "Dark brown, mottled with white." (*Hutton.*)

Immature bird. (Campbell Island.) Wing 16·5 inches; tail 6·5; tarsus 3·0; middle toe (without claw) 2·5; bill to gape (straight) 2·5, height at base 0·88.

(Ceylon.) Pale brown throughout, the neck-feathers with light shafts and greyish tips; the under-surface feathers tipped with greyish; wing-coverts with the central portions near the tip fulvous, becoming paler at the extremities of the feathers.

Obs. Mr. H. Saunders finds that the largest birds are from the Southern Ocean, between the Cape of Good Hope and New Zealand, and that those from the South Atlantic have a tendency to a pale frill of acuminate feathers.

A likely bird, perhaps, to occur in Ceylon is the Skua inhabiting the Mekran coast, and which Mr. Hume has named *S. asiaticus* (Stray Feath. 1873, p. 269), considering it to be different from Richardson's Skua. The specimen which constitutes the type measures:—Length 19·0 inches; wing 13·0; tail 6·4, central feathers 0·75 longer than the adjacent pair; bill at front (including cere) 1·2, from gape 2·02. Iris brown; legs and feet dull black; bill brown; cere pale greenish brown; chin, throat, and breast white, the flanks barred with brown.

Distribution.—A fine immature example of this Skua was brought to me at Colombo, in October 1875, by a native, who stated that it had been caught by another man near Maravilla, on the Negombo and Chilaw canal. The bird's wing was cut; it was very tame, and it had the appearance of having been accustomed to the society of man, although the native asserted that it had been caught only a few weeks. I am unwilling, in the face of this not wholly reliable evidence,

does not seem to have noticed it on the China coasts. Northward of the Mongolian territory it does not seem to extend, for it is not recorded from Siberia; and though Cassin noticed it as having been obtained in Japan by Parry's expedition, Mr. Saunders is of opinion that the example in question was nothing but *L. ridibundus*.

Habits.—The Brown-headed Gull, which takes the place in Ceylon of the Kittiwake and the Laughing Gulls of European coasts, associates in large flocks, and when thus assembled together in certain localities, to feed on the shoals of sardines which throng the sea on the north coasts, is quite as much an ornament to tropical waters as those well-known birds are to English seas. They follow shoals of these fish for days, and collect in hundreds at fishing-time, hovering over the buoys of the sein-nets, some alighting on the water and seizing the fish which jump over the line, others plunging down on their prey from above, while many spend their time in fruitless endeavours to snatch the food from the much swifter-flying Terns. They evince no fear whatever of the scantily-clad fishermen, dropping into the water within an oar's length of their canoes, or joining

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to take it for granted that it was captured in a wild state so far out of the known range of the species; and I therefore place it as a doubtful member of the avifauna of Ceylon. At the same time, by so doing, I by no means wish to infer that it may not, in like manner with the Cape Pigeon, have strayed north into the Gulf of Manaar; I adopt the present course simply because I am unable to prove that it was not brought to the island in a ship from southern seas.

The habitat of this large Skua is the southern seas, from the edge of the pack-ice northward to the Cape of Good Hope and the shores of Australia. Between these parallels it is found in the vicinity of the existing islands, but does not occur from New Zealand eastward to Cape Horn, where, again, it is found at the Straits of Magellan and the Falkland Islands. Its most northerly *ordinary* limit in the Pacific appears to be Norfolk Island, but it has occurred as far north as Rockingham Bay. It was procured by the naturalists of H.M.S. 'Challenger' at Tristan d'Acunha, Kerguelen Island, and the Falkland Islands. Captain Hutton states that it is very numerous on Kerguelen Island and Prince Edward's Island, breeding there, and that it is very rare north of lat. 45° S. At the Cape, Layard observed it in April; but it does not seem to be common there. Gould likewise records it from the Cape of Good Hope and near Cape Horn, and remarks that he saw it nowhere so abundant as off the coasts of Tasmania, near Storm Bay. I have seen it frequently off the west coast of Australia, and in the Bight between King George's Sound and Bass's Straits. The occurrence of one specimen only on the coasts of New Zealand is noticed by Mr. Buller.

Habits.—The Skuas (or Parasitic Gulls, as they are sometimes called) subsist largely on the food taken by Gulls, Terns, and Petrels, which they chase until they drop their booty. The Antarctic Skua, which is one of the largest of its family, is a bird of bold, fierce disposition and powerful flight, often wandering far from land in company with the Petrels which affect the Southern Ocean, and associating with them, in order to rob them of the food which they pick up in the wake of vessels. I have seen it steadily cruising round a flock of "Cape Pigeons," watching for an opportunity to launch itself after these assiduous toilers of the sea: catching sight of one which has picked something up, a few vigorous strokes of its pinions give it the required impetus, and it descends with a rush upon the pretty bird, turning and twisting after it with almost motionless pinions. Dr. M'Cormack, of H.M.S. 'Erebus,' speaks of a fierce Skua (evidently this species) which haunted the breeding-place of the Albatross at the Auckland Isles, ever on the watch to pounce down and devour this bird's egg on her quitting it in search of food. It is said to prey on the flesh of other birds at Kerguelen Land, avoiding the water. The individual alluded to above was kept by me in confinement for six months, and then brought home to the Zoological Gardens, where it was unfortunately allowed to fly away. I confined it in an aviary containing a Ceylon Wood-Owl and a Malay Bittern (*Gorsachius melanolophus*); it proved to be, as might have been expected, a most ravenous bird, gobbling up the Owl's meat whenever it dropped from the perch above, or chasing the Bittern round the aviary and snatching its food from its bill, and this after it had been amply fed itself. It had a hoarse cackling cry, which it chiefly gave vent to when hungry.

Nidification.—This Skua, which has been found breeding on the Crozets, Kerguelen Land, and Prince Edward's Island, lays, according to Captain Hutton, on low flats, among moss and grass two or three feet high, making no nest. The eggs are two or three in number, and are described by Layard, from specimens brought from the Crozets, as "pale brown-green, spotted, chiefly at the obtuse end, with large and distinct pale purple and brown blotches;" they measure 3·0 by 2·08 (2″ 1‴) inches. An egg from the Chatham Islands is described by Capt. Hutton as olive-brown, with large brown and purplish-grey spots; length 3·1 by 2·1 inches.

four or five together in chasing a Tern, which, hotly pursued, almost dashes against the boats as it darts through the thick of its enemies and swallows its prey in its flight. I have not noticed this Gull dive as the Kittiwake does when plunging into a shoal of sprats; but it spreads out its legs, and half alighting on the water as it reaches the surface, bobs its head under and seizes the fish. When tired of circling round, flying up and down, and hovering over the shoals of fish, they settle in flocks of a dozen or more on the water, floating lightly on its surface close together, some every now and then rising and starting off on a new cruise, while others espying the flock from a distance, come and join it. They repose a good deal on rocks, two or three sitting together; and their mode of progression on the sea-beach is by short little runs, which they take with considerable grace of deportment. This Gull, like others of the smaller species, is noisy when in company, and constantly utters its note *krāh-krāh*, particularly when chasing its companions for the fish they have been fortunate enough to catch.

Nidification.—Although this species has been ascertained to breed near the Pangong Lake in Thibet and in the valley of the Hoang-ho, no account of its nesting-habits, or description of its eggs and nest, have as yet been published. Whether Prjevalsky took the eggs or not I do not know; but Dr. Henderson did not succeed in finding the nest at the Pangong Lake.

GAVIÆ.

Fam. PROCELLARIIDÆ.

Bill hooked at the tip, which is elevated and distinct from the base in both mandibles; sides grooved, in some furnished with lamellæ; nostrils tubular, placed on the base of the culmen and opening to the front. Wings long and pointed. Tail short, variable in the number of feathers. Legs short, placed far back; the tibia more feathered than in the last family. Feet fully webbed, the outer toe not shorter than the middle; hind toe present as a claw only.

Of oceanic habit and powerful flight. Of variable size. Nesting on rocks or in holes in the ground. Sternum with one fissure in each half of the posterior margin.

Genus PUFFINUS.

Bill rather long and slender, the tip much elevated and hooked, the gonys curved; nostril-tube flattened above, rather short, and with two orifices with a division equal to their width. Wings long, the 1st quill slightly exceeding the 2nd. Tail of 12 feathers, graduated, rounded at the tip. Tarsus much compressed, the sides protected by well-defined scutes, shorter than the outer and middle toes; hind claw very small.

PUFFINUS CHLORORHYNCHUS.

(THE GREEN-BILLED SHEARWATER.)

Puffinus chlororhynchus, Lesson, Traité d'Orn. p. 613 (1831); Newton, Ibis, 1861, p. 181, et 1867, p. 359.

Puffinus, sp.?, Legge, Str. Feath. 1875, p. 374; Hume, ibid. 1879, p. 115 (List B. of Ind.).

Adult male (Ceylon). Length, from skin, 15·5 inches; wing 10·6; tail 5·2; tarsus 1·8; middle toe 2·0; outer toe 2·0; bill to gape (straight) 2·0; length of nostril-tube 0·3.

Iris dusky; bill dusky greenish; legs and feet fleshy white.

Above glossy smoke-brown; the wing-coverts and tertials slightly darker than the back, the latter with a greyish tinge or bloom (similar to the appearance of a Tern's wing) on the centre of the feathers; primaries and tail brownish black; beneath uniform pale brown; the chin and gorge pervaded with ashy grey; under tail-coverts dark brown, the tips slightly paler than the rest of the feathers; under wing uniform grey-brown.

Obs. An example of this Petrel in the British Museum from Bourbon is a facsimile of the specimen here described; the only difference perceptible is the slightly less grey tint of the under surface. It measures:—Wing 10·8 inches; tail 5·0; tarsus 1·8; middle toe and claw 2·25; bill to gape (straight) 2·0, length of nostril-tube 0·35.

This species is very close to *P. fuliginosus*, which is larger, has a longer bill and white under wing-coverts: wing 11·5 to 11·7 inches, tarsus 2·1, bill to gape 2·2.

A species of this group inhabiting the Persian Gulf, and larger than the Dusky Shearwater, *P. obscurus*, Gm., has been described by Mr. Hume as *P. persicus* (Str. Feath. 1873, p. 5). It measures—length 13·0 inches, wing about 8·0, bill at front 1·2. "Bill pale lavender, dusky at the tip; iris dark brown; legs white, with an opalescent gloss; lower part of tarsus blackish" (*Butler*). Upper plumage blackish brown, paler on the head; the underparts white, with the flanks, axillaries, and a portion of the under wing-coverts and the longer under tail-coverts deep brown; the white of the face encircles the eye, extending backwards from the posterior angle as a narrow streak for 0·4 inch (*Hume*).

Distribution.—This species, which is one of the most interesting of late additions to the avifauna of Ceylon, occurred for the first time on the west coast in May 1875. During the height of the S.W. monsoon two individuals were met with on the Bolgodde Lake not far from Panedura. They were on the water near the mouth of the lake, and one was shot, the other escaping. The specimen procured was sent to Mr. MacVicar, who gave it to me. In January 1875 I saw two Petrels, evidently of the same species, swimming in the sea near the fort of Trincomalie; and recently Mr. MacVicar writes to me that the Colombo Museum has acquired a specimen shot last year on the west coast. The Green-billed Petrel would therefore appear to be a not unfrequent straggler as far north as Ceylon. It is an inhabitant of the southern part of the Indian Ocean, and is not at all uncommon at the Mauritius, Bourbon, Rodriguez, and other islands. Mr. Edward Newton met with it at Rodriguez in October; and the Shearwater of the Seychelles, which he met with between the islands of Praslin and Mahé, is identified by him doubtfully as this species. Specimens were evidently not procured, and hence the doubtful identification; but it is probable, I think, that the birds seen were Green-billed Shearwaters. I have seen dark Petrels near the Cocos Islands, and thence southwards to the vicinity of the west coast of Australia, which I conclude belonged to the present species.

Habits.—Like other members of its family, this Petrel is purely a denizen of the ocean, dwelling on the wide waste of waters hundreds, nay thousands, of miles from land, which it rarely approaches, except for the purpose of rearing its young. All Petrels appear to be perfectly at home in all weathers on the vast ocean expanse; and the present species forms no exception to this rule. Solitary individuals are frequently seen flying across the track of vessels passing through the trade-winds; they come in sight, perhaps, away on the weather-beam, shearing over the billows, one wing up and then down, with great speed; in a few minutes they

will have crossed ahead of the ship or flown round it at a distance, making their way off to leeward, and disappearing as rapidly as they came in sight. Their flight is performed by swaying the body as it were from side to side, with the wings outstretched, and not flapping, but turned up successively from the horizontal, the course after each sudden inclination being downward and then up again with a rapid sweep, overtopping the waves, and instantly dropping again into the succeeding trough of the sea. They feed on marine substances, oily matter, the fat of whales when it can be procured, and any garbage they may find floating on the water. They sit buoyantly on the water, and must of necessity sleep in that position, possibly reposing a good deal by day.

Nidification.—The Green-billed Petrel breeds at Round Island, Mauritius, at Rodriguez, and probably other islands in the Indian Ocean. Mr. Edward Newton, who visited a breeding-place of this species at the first-named island, gives an interesting account of it in the 'Ibis,' 1861, p. 181, stating that there is a large colony at the north-east of the island, although they are spread over the greater part of it. He observes that they are as tame as the Tropic-birds, but not so harmless. "They breed," he says, "under stones, and bite most awfully if they get a chance. The only way to get them out and take their single egg is to contrive to turn them round so that one can grab their folded wings and tail. If dropped on the ground they will run about, and for some time will not try to fly; but if thrown into the air, they will glide down gently towards the sea. On going near any rock where there may be a dozen or two, one bird seems to give the alarm, and a chorus of the most extraordinary sounds immediately proceeds from under ground. I hardly know what to compare it to, as there is nothing like it except, perhaps, the noise made by cats when they set up their backs and squall. . . . It is kept up for a minute or two, and increases when the individuals are hauled out in the manner above described." Two eggs of this Petrel from Round Island, for an examination of which I am indebted to Mr. Foottit, of Croydon, are elongated ovals, one slightly broader than the other, and both a little pointed at one end; they are dull white and smooth in texture, measuring 2·57 by 1·51 and 2·3 by 1·53 inches.

Genus DAPTION.

Bill short, stout, the base rounded, with a groove running out to the tip; sides inflated; nostrils with a single orifice, and divided inside the tube, which is flattened and slightly elevated in front; upper mandible with very shallow oblique lamellæ; gonys straight. Wings long, pointed, the 1st quill the longest; secondaries short. Tail short, of 14 feathers, and rounded at the tip. Tarsus reticulate in front, compressed laterally, and shorter than the middle toe, which is shorter than the outer; hind claw stout and very short.

Under tail-coverts very long.

DAPTION CAPENSIS.

(THE CAPE PETREL.)

Procellaria capensis, Linn. Syst. Nat. i. p. 213 (1766).

Daption capensis (Linn.), Steph. Shaw's Gen. Zool. xiii. p. 241, pl. 28 (1820); Gould, B. of Austr. vii. pl. 53 (1848); Hutton, Ibis, 1865, p. 287; Hume, ibid. 1870, p. 438; Buller, B. of New Zeal. p. 299 (1873); Hume, Str. Feath. 1879 (List B. of Ind.), p. 116.

Le Pétrel tacheté ou *le Damier*, Buffon, Pl. Enl. 964; *White-and-Black-spotted Petrel*, Edwards, Glean.; *Cape Pigeon* of sailors; *Pintado Petrel* of some.

Adult male and female (Australian seas). Length, from the skin, about 16·0 inches; wing 9·7 to 10·5; tail 4·0 to 4·3; tarsus 1·6 to 1·7; middle toe 2·0 to 2·1; bill to gape 1·5, height at tip 0·4; length of nostril-tube 0·4. "Weight 14 to 18 oz." (*Gould*). "Expanse 36·0 inches" (*Hutton*).

Genus OCEANITES.

Bill slender, vertically compressed, tip much hooked; nostrils placed in a narrow single tube, much recurved at the front. Wings much pointed, the 2nd quill the longest, the 3rd next and considerably longer than the 1st. Tail emarginate, of 12 feathers. Legs moderately long, with a considerable portion of the tibia bare; tarsus smooth, and longer than the outer toe, which exceeds the middle; claws flattened.

Of small size.

OCEANITES OCEANICUS.

(WILSON'S STORM-PETREL.)

Procellaria oceanica, Kuhl, Beitr. Zool. p. 136, tab. x. fig. 1 (1820).
Thalassidroma wilsoni, Bonap. Comp. List, p. 64 (1838).
? *Thalassidroma pelagica* (Linn.), Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 272.
Thalassidroma ——?, Holdsw. P. Z. S. 1872, p. 480; Legge, Str. Feath. 1875, p. 375.
Oceanites oceanicus (Kuhl), Dresser, B. of Eur. pt. 67, 68 (1878).
Mother Cary's Chicken of sailors (applied to all the Storm-Petrels).

Adult female (Mekran coast). "Length 7·12 inches; wing 6·25, expanse 16·37; tail 3·0; tarsus 1·3; bill at front 0·5, from gape 0·7." (*Hume*.)

Iris brown; bill black; legs and feet shining black, the webs duller, with a yellow patch in the centre.

Dark sooty brown, the wings and tail blackish brown, and the tail darker than the back; secondaries and tertials paler than the primaries; upper tail-coverts and the sides of the lower white; lower flanks white in some.

Obs. This species differs from the common Storm-Petrel, *O. pelagica*, in the length of its legs and the peculiar coloration of its feet. It is slightly larger too. A specimen of the latter in my collection measures—wing 4·6 inches, tarsus 0·9, bill to gape 0·6.

O. melanogaster, Gould, which inhabits the Australian seas, and has been found in the Bay of Bengal, may occur on the coasts of Ceylon, and may, indeed, be the species that has been seen there, instead of the subject of the present article. It measures—wing 6·5 to 6·6 inches, tail 3·0 to 3·45, tarsus 1·65 to 1·7, bill to gape (straight) 0·83. The upper tail-coverts are white, with the feathers of the rump above the white band tipped with white; feathers along the edge of the wing above and beneath whitish; under tail-coverts, vent, and sides of belly and breast

Iris brown; bill black; legs and feet deep brown, the toes spotted at the side with whitish.

Head, face, cheeks, hind neck and its sides brownish black; the upper throat and chin spotted with the same in some, in others with the white of the entire under surface extending almost to the chin; back, scapulars, rump, upper tail-coverts, and tail white, tipped with black, gradually less to the upper tail-coverts; tail with a black terminal band $1\frac{1}{4}$ inch in width; lesser wing-coverts, primary-coverts, terminal portion of the secondaries, outer webs of the primaries, and a considerable part of their inner webs brown-black; greater coverts and rest of the primaries and secondaries white; under tail-coverts tipped with blackish brown; axillaries tipped with black; all the central part of the under wing white, black round the edge.

Captain Hutton observes that this species varies but little in plumage, so that the adult dress must be put on by the time the young birds have spread over the ocean and commenced to follow ships, after the manner of their kind.

Distribution.—This well-known Petrel, the Cape Pigeon of sailors, finds a place as an oceanic species in the list of Ceylon birds owing to the fact of an example having been killed in the Gulf of Manaar between Ceylon and the mainland. Mr. Hume recorded the capture of this bird (which, it would appear, was killed by a Mr. Theobald) some years ago in the 'Ibis.' It is a remarkable instance of a southern oceanic species straying far beyond the limits of its ordinary range; and there is no reason why the Antarctic Skua should not likewise have wandered thus far north. This species is one of the most abundant Petrels in the southern hemisphere, and is familiar to all who have made the voyage round either cape to Australia. It is equally

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white, the middle of the breast and belly blackish brown; axillaries and centre of under wing white; bases of the feathers across the throat whitish, showing conspicuously in some. *Immature birds* have the feathers of the back and the scapulars tipped with white, and a conspicuous patch of the same across the throat.

Distribution.—The identification of any bird on the wing, particularly an oceanic species, is at all times very unsatisfactory; and I regret exceedingly that the interesting little visitor in the shape of a Storm-Petrel, which has been frequently seen on the Ceylon coasts, has not been shot, and its identity put beyond all doubt. Layard speaks of it as occasionally flitting about the roads at Colombo and the Galle harbour; and Mr. Holdsworth has seen it at Colombo and on the west coast during stormy weather, remarking in his catalogue that it has seemed to him "entirely black, with the exception of the white rump." On the 19th August 1874 I observed an individual flying about in calm weather in the wake of the colonial steamer 'Serendib' at Batticaloa. I could see no other white marking about it beyond the white upper tail-coverts, which would be the case with Wilson's Storm-Petrel, as the white under tail-coverts could not be seen. As, however, the bird was not nearer to me than 100 yards, and was flying low, I could not have easily distinguished the white sides of the breast and belly had it been *O. melanogaster*, and therefore it is impossible to say with certainty what our species is. In the Mergui archipelago Mr. Davison has seen numbers of Storm-Petrels in July which Mr. Hume considers to belong to this species. Captain Butler met with it and obtained specimens on the Mekran coast and in the Gulf of Oman in May. It is found in the South Atlantic, frequenting Table Bay sometimes; it ranges into the North Atlantic, straying to the west coasts of Europe and the British Isles. In the Australian seas it is abundant, and is seen generally off and on between there and the Cape of Good Hope. On the Australian coasts it is recorded by Mr. Ramsay from Wide Bay, New South Wales, Victoria, South Australia, Tasmania, and Western Australia. It inhabits the New-Zealand seas, and has been found at New Caledonia. It is seen on the eastern coasts of North America, and is not uncommon near the Azores, ranging also southwards to Kerguelen Land.

Habits.—Like all Storm-Petrels, this little bird is an inhabitant of the wide ocean, being seen in company with its congeners about ships, where it picks up plenty of food in the shape of refuse thrown overboard. It often settles on the water, and flies much with its legs down, patting the crests of the waves as it skims over them; and at this time I have noticed that it raises its wings high above its back. Its flight is performed with rapid beating of the wings, and is very speedy. Its tiny form, besides being very apparent against the huge billows, is much dwarfed by contrast with immense Albatrosses, among which it often intrudes when following ships.

I know nothing of the *nidification* of this Petrel; but an egg in the Wolley collection, which Professor Newton informs Mr. Dresser is probably authentic, measures 1·28 by 0·81 inch. The Storm-Petrels breed on the ground among stones, or in sandy burrows or crevices. The eggs are white, or white with small reddish freckles.

numerous in the South Atlantic, South Indian, and South Pacific Oceans, but nowhere more so than off the Australian coasts, appearing on the passage down from Galle in latitude 30° or 32°, and accompanying the ship thence to Bass's Straits. It is common off the coasts of New Zealand, and between there and Tasmania. I have not found it so abundant off the Cape of Good Hope, which, however, I rounded at the end of April, when the bird was mostly absent at its breeding-haunts. Mr. Gould records it as plentiful off the Horn, and remarks that, owing to its habit of following ships, it is led away into warmer latitudes than it usually frequents; he was informed by Lieut. Blackett, R.N., that it will follow vessels from the Cape of Good Hope to St. Helena, and from Cape Horn to Rio Janeiro. I find it mentioned by Mr. Ramsay as having occurred at Cape York probably under similar circumstances; and this being the case, its appearance near the coasts of Ceylon is not difficult to account for. A second instance of its occurrence north of the Line is known to me, namely, when Layard met with it, in November 1866, in lat. 3° N., which is about five degrees lower than the point reached by it in the Gulf of Manaar.

Habits.—Of the many species of Petrel which follow in the wake of ships voyaging in the south seas, greatly assisting by their animated presence to vary the monotony of a long passage, none are more attractive than the Cape Pigeon, whose variegated black-and-white plumage contrasts with the sombreness of many of its smaller companions; while the persevering manner in which it courses backwards and forwards just underneath the stern of the vessel, making turn after turn with almost motionless wings, merely inclining the body towards the perpendicular to enable it to reverse the direction of its flight, cannot fail to rivet the attention of the traveller. In common with all its family it is possessed of extraordinary powers of flight, the most remarkable feature of which is the great amount of impetus or momentum which is imparted to the body by a few vigorous strokes of the wing, enabling the bird to progress for some distance afterwards with no other motion than a quick upturning of the wing-plane to enable it to turn in its course. The progress thus made by the Cape Pigeon is very rapid, for it sweeps backwards and forwards with greater proportional speed than most other species. When any substance is observed on the water, these birds settle down for an instant, sitting lightly on the billows until they rise again, which they do by spreading out their wings and taking one or two vigorous strokes, propelling themselves along the surface, and then mounting in the air. They are caught by means of white worsted let out from the stern of the vessel, which, not seeing, they fly against, and entangling their wings, are hauled on board. Sometimes a piece of wood is attached to the worsted, which falls in the water, and, scudding along after the vessel, keeps down the end of the string. I have tried these means, and know that they fail entirely if the speed of the vessel is not slow. When brought on deck this and other Petrels vomit, out of sheer fright, a strong-smelling oily substance, which in the present bird is said to be of a red colour. They are unable to rise from the deck. "Their cry," writes Captain Hutton, "is like the sound made by drawing a piece of iron across a large-toothed comb—*cac, cac, cac-cac, cac,* the third being pronounced the quickest." I have never heard it utter any note on the wing; and I imagine that, as a rule, it is a very silent bird.

Although so common a species, the breeding-haunts of the Cape Pigeon do not appear yet to have been discovered, as it does not resort to Kerguelen Land, Tristan d'Acunha, or other islands frequented by Albatrosses. Darwin was informed by sailors that it bred on the island of South Georgia; and it is not improbable that it may resort to other portions of land near the Antarctic circle and beyond the limits of ordinary voyages.

Order PYGOPODES.

Bill straight and pointed. Wings short. Tail wanting or rudimentary. Tarsus highly compressed; feet lobed; hind toe elevated.

Plumage silky. Tibia enclosed within the integuments. Young following the parent when hatched.

Genus PODICEPS.

Bill straight, high at the base, pointed, the commissure nearly straight from the gape, which is angulated; gonys short and ascending; nostrils oval, advanced, placed in a lengthened membrane. Wings short, concave, pointed; the 1st and 2nd quills the longest; the inner webs notched. Tail wanting. Tibia feathered nearly to the knee. Tarsus highly compressed, serrated posteriorly, scutellate anteriorly. Feet very large, webbed at the base, the terminal portion of the toes lobed; nails broad and flattened; hind toe lobed.

Neck slender. Under plumage silky. Sternum very short, broad, expanding at the posterior edge, with one rounded notch.

PODICEPS FLUVIATILIS.

(THE LITTLE GREBE.)

Colymbus fluviatilis, Tunstall, Orn. Brit. p. 3 (1771, ex Briss.).

Colymbus minor, Gm. ed. Syst. Nat. i. p. 591 (1788).

Colymbus philippensis, Bonnat. Encyl. Méth. i. p. 58, pl. 46. fig. 3 (1823).

Podiceps gularis, Gould, P. Z. S. 1836, p. 145.

Podiceps philippensis (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 311 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Jerdon, B. of Ind. iii. p. 822 (1864); Holdsw. P. Z. S. 1872, p. 480; Legge, Ibis, 1875, p. 407; David & Oustalet, Ois. de la Chine, p. 512 (1877).

Podiceps minor, Hume, Nests and Eggs, iii. p. 646 (1875); id. Str. Feath. 1879 (List B. of Ind.), p. 115.

Podiceps fluviatilis (Tunst.), Dresser, B. of Eur. pt. 77–79 (1880).

Le Castagneux; *Le Castagneux des Philippines*, Buff.; *Little Grebe*, Lath.; *Dabchick*, popularly. *Churaka*, *Pandub*, *Pan tirri*, Hind.; *Dubari*, Bengal.; *Chumighak*, lit. "Diver," Turki (Scully); *Mukelepan*, lit. "Diver," Ceylonese Tamils.

Diya-Saaru, Sinhalese.

Adult female (Ceylon). Length 9·2 inches; wing 3·9 to 4·0; tarsus 1·1; middle toe 1·8; hind toe 0·4; bill to gape 1·0, at front 0·75.—*Male* (Furreedpore). Length 8·1 to 9·0 inches; wing 3·75 to 4·0; tarsus 1·25; bill from gape 1·16 to 1·18, at front 0·8 to 0·83: weight 5·5 oz.—*Female*. Length 8·2 inches; wing 3·83; tarsus 1·25; bill from gape 1·12, at front 0·77: weight 5·87 oz. (*Cripps*).—*Adult*. (India, Brit. Mus.) Wing 3·7; tarsus 1·18; bill at front 0·73. (England) Wing 3·85; tarsus 1·18; bill at front 0·67.—*Male*. (Egypt, Mus. Dresser)

Wing 3·9; tarsus 1·8; outer and middle toe 1·8; bill at front 0·82. (Nepal) Length 9·4 to 9·6; wing 3·9 to 3·95; tarsus 1·3 to 1·4; bill at front 0·7 to 0·78 (*Scully*).

Iris dull golden; bill black, with a white tip, base and round the gape pea-green; legs and feet blackish green; inside of tarsus pale olive-green. In the breeding-season there is a yellow spot at the gape.

Breeding-plumage (Ceylon). Chin, gorge, and front of cheeks blackish brown; head and hind neck black-brown, pervaded on the head with grey; ear-coverts, sides and front of neck glossy chestnut, the feathers slightly tipped with white; back, scapulars, rump, and wing-coverts brown; the interscapulary region and scapulars with the feathers tipped with grey; primaries paler brown than the wing-coverts, white at the base; secondaries white, washed with brown at the terminal portion of the outer webs; feathers round the rump brown, their bases tawny yellow; chest and flanks brownish, the feathers tipped with white; middle of the breast white, the bases of the feathers brown at the sides; lower flanks and vent greyish brown, the former with the bases of the feathers yellow, like the rump; under wing white.

Some examples are much whiter than others, and are apparently birds in their second year, as the white under surface is characteristic of youth.

In winter there is no *rufous* on the neck, but the throat is rufous-buff, extending on to the ear-coverts, and the chin and gorge are whitish.

Young. The chick is covered with dark grey down.

Immature (India, B. Mus.). Chin and throat white; ear-coverts, sides of neck, and head pale rufous, the upper surface paler brown than in adults; the under surface white. "Bill, culmen black, rest light orange; legs greenish ochre, soles black; iris reddish yellow" (*Cripps*). The red of the neck is more or less absent in some specimens.

Obs. Although the Indian, Chinese, and Philippine races of this Dabchick have been separated from the European form by some authors, there appears to be no valid reason for such a determination. The species varies somewhat according to country and climate, but not, so far as I can see, in any constant manner, and accompanied by any corresponding difference in size. European examples are, I think, darker than Indian, particularly on the under surface; there is more black on the chin, and especially more brown on the outer webs of the secondaries, which latter characteristic has given rise to the separation of the eastern form as a white-winged bird; there is perhaps less of the rufous-chestnut on the neck, but the plumage is of the same general character. As will be seen in the synonymy, Tunstall's title has priority over Gmelin's generally adopted name. The race inhabiting the Malay archipelago appears to have a longer bill than the Indian; but I observe that Herr Meyer identifies the Celebean bird as *P. minor*. A Timor specimen in the national collection has the bill at front 0·9 inch.

The Australian Little Grebe, *P. novæ-hollandiæ*, is united with the present species by Messrs. Schlegel and Dresser; but one or two specimens I have examined do not correspond well enough with the latter for me to consider the two forms identical; so for the present I keep the Australian bird distinct. It has the chin, cheeks, and throat black, *the rufous coloration being confined to a broad stripe down the sides of the neck*, the fore neck beneath the black being pale brownish, passing into the greyish brown of the chest. Other species not very dissimilar are *P. nestor*, Gould, from Australia, and *P. rufipectus*, Gray, from New Zealand, which have the head and cheeks striped with grey. In the former the head is brown and the throat mouse-grey; in the latter the head is black and the fore neck reddish.

Distribution.—The Dabchick is widely distributed throughout the low country of Ceylon, besides which it has, I am informed, recently found its way up to the Nuwara-Eliya lake, which has an altitude of 6200 feet. It is nowhere seen in larger numbers than on the Colombo Lake, where it is a permanent resident; on some occasions I have seen a flock of more than thirty on the larger sheet of water, and, as a general rule, there are a dozen or more in this locality. It is not uncommon in the tank-districts from Kurunegala northwards, and I have met with it in small village tanks near Trincomalie. Its having ascended the highest mountains in the island and discovered the newly constructed lake at Nuwara Eliya is very remarkable, as there is a rise to the plateau, both on its eastern and western side, of more than 2000 feet, both streams flowing down precipitous and forest-clad gorges; but I am credibly informed by several people, and among them by Mr. Thwaites, of Hakgala, who pays particular attention to the birds of the district, that it *has* been seen there during the cool season.

In India this Grebe is abundant: there is, writes Mr. Hume, scarcely any considerable-sized pond,

tank, or lake on which it may not be seen during the cold weather. It inhabits elevated waters, being found permanently at the lake on the summit of the Palanis, at Ootacamund, and in the valleys of Cashmir. As regards the low country, it is common in the Deccan, in Orissa, Chota Nagpur, and the surrounding region, Lower Bengal, the Doáb, and thence up into Cashmir and the Punjab, as well as through all the province of Sindh and the surrounding country. Eastwards it extends from Nepal through Cachar, Upper Burmah, where it is very common, to Tenasserim, in which province it appears to be sparingly distributed. Beyond this region again it is found in Hainan, China, Formosa, and the Philippines. In the winter it is found on the China coasts, frequenting salt water, whither it is driven from inland waters by the frost. Southward it extends to some of the Malay islands, among which are Celebes, Ternate, and Timor. To the north of China it occurs in Japan, being common in Yezo and other parts. Returning again to Central Asia, we find it recorded by Severtzoff as resident in Eastern Turkestan; and the same is the case, to a limited extent, in the highlands of Kashgharia, where Dr. Scully found it in December about unfrozen pools. It is found in suitable localities in Persia; and Canon Tristram met with it in "amazing numbers" at the Sea of Galilee, and also saw it in winter on the Dead Sea; but in the breeding-season it disperses all over the country. In all the southern and central countries of Europe it is very common, inhabiting also the islands of the Mediterranean. In Great Britain it is an abundant species, and universally distributed in suitable localities northward to the Orkneys and the Hebrides, beyond which it is an occasional visitor to the Faroes. It does not breed in Shetland; but we learn from Mr. Robert Gray's work that its nest has been found in Scotland at an elevation of 2000 feet. In Western Europe it ranges through Belgium and Holland, where a few remain in winter, into Denmark, arriving there, according to Mr. Dresser, in April and leaving in September, and beyond which it extends into Southern Sweden and Norway as far as lat. 62° N., likewise straying rarely to Finland (*Dresser*).

It is found in the Baltic provinces and in Poland, being resident in suitable localities, according to Mr. Dresser, who also remarks that it breeds in the eastern portions of Northern Germany, and inhabits Russia as far north as the Riazan Government and the neighbourhood of Moscow; it is also resident in parts of Southern Germany and Austria, although it is, writes Messrs. Danford and Harvie Brown, not common in Transylvania. In Spain, as also in Italy and Sicily, it is, as a matter of course, a stationary species. In Andalucia, according to Col. Irby, it breeds abundantly in some localities; and in Sardinia it is abundant in winter.

On the continent of Africa it is widely distributed, extending from Morocco on the west and Egypt on the east, down both coasts to Cape Colony, where it is common, according to Layard. It is resident, says Favier, in Morocco, but is nevertheless, to a certain extent, migratory, passing north in April and returning in October and December. In Algeria it is a stationary species, as also in Egypt, where it is common; but does not, according to Captain Shelley, affect the Nile. Von Heuglin met with it on the lagoons of the Delta, and on canals and other inland waters in Nubia and Kordofan, and on the Blue Nile; whilst in Abyssinia he found it resident from an elevation of 5000 to 11,000 feet. Southward on the east coast it has been found at Mozambique and Mombas, and extends to Madagascar, where it is resident. It has also been procured in the Mauritius. It is not uncommon in Cape Colony, and is likewise an inhabitant of Damara Land, Benguela, Gaboon, the Gold Coast, and Senegambia. In Damara Land Mr. Andersson procured it on Lake Ngami and other localities in the interior, among which, at the vleys of the Ondonga country, it breeds in vast numbers.

Habits.—The Little Grebe inhabits ponds, tanks, lakes, canals, and other still waters, associating usually in small flocks of half a dozen to twelve individuals, but occasionally assembling in larger numbers, which form a scattered troop generally divided into little parties, keeping at a slight distance from one another. When undisturbed the Dabchick passes its time diving for food or quietly floating upon the water. When pursued in a boat it is capable of swimming very fast, frequently diving and staying a considerable time under water, sometimes reappearing at a long distance behind, or on either side of, the pursuer. It is a most expert diver, disappearing apparently at the flash of the gun, and is consequently very difficult to hit; but when a flock are fired into some of the members frequently get on the wing and fly along the surface of the water, thus exposing themselves to the more effectual aim of the shooter. On the

Colombo Lake I have seen a large flock fly more than half a mile, and, mounting fully 12 feet in the air, endeavour to clear a small steamer which was crossing their course; this, however, is unusual, as the flight of the Dabchick is generally a mere flapping along the surface of the water. Notwithstanding, however, its unwillingness to take long flights, it must be possessed of considerable power of wing, or it could not find its way to artificial pieces of water such as the Lakes of Ootacamund and Nuwara Eliya. The food of this Grebe consists of vegetable matter, larvæ, water-insects, and occasionally minute mollusks and crustacea. Its note is a clear and not unmusical whistle.

Nidification.—The Little Grebe breeds in the Western Province during the S.W. monsoon rains, and, I apprehend, nests in secluded nooks on the Colombo Lake, although I never succeeded in finding its nest. In India it breeds from August till September in the north and in Cashmir, and in May and June in the Nilghiris. According to Mr. Hume, "the nests are sometimes fixed to the branches of some water-overhanging tree a couple of feet above the water, and are then made of twigs, grass, weeds, and leaves; but generally they are mere masses of weeds and rush, founded on some tuft of water-grass, and little, if at all, above the water level." From my own experience, which is confined to the finding of nests in the marshes of Essex, I should say that they were frequently constructed simply as floating masses. I have found them among reeds secured between the upright stalks, and constructed of flags, reeds, and weeds, about 10 inches in diameter, 6 inches thick, and with a hollow, about 2 inches deep, for the reception of the eggs. The eggs, which varied from 4 to 6, were invariably covered over with wet weeds, which, during the day at any rate, seem to afford sufficient warmth for purposes of incubation, inasmuch as the birds have been ascertained not to resort to their nests at that time. It is evident, however, that but little warmth is required to sustain life in this bird's eggs, as I once kept some for nearly thirty hours, and on proceeding to blow them was astonished to find the young alive and cheeping within them. The eggs are long narrow ovals, equally tapering at both ends; the shell is thick and rough in texture, and when first laid is of a dull white colour, becoming afterwards discoloured to yellowish white; some have slight smudges of brown. They measure from 1·5 to 1·6 in length, and from 0·8 to 1·0 inch in breadth. The interior of the shell is deep green. In India the eggs are said to have a faint bluish-green tinge, and vary from 1·28 to 1·52 in length, and from 0·77 to 1·1 inch in breadth. The young appear to take to the water as soon as they are hatched, as I have found newly broken shells in nests without seeing any signs of young near them. They are said not to be able to dive until a few days old, and are often taken on the back of the parent bird when very young.

Order ANSERES.

Bill broad, flattened and depressed towards the tip, covered with a soft skin; tip terminating in a hard decurved "nail;" upper mandible in all but one genus wider than the under, the edges furnished with lamellæ. Wings pointed. Tail short. Legs in some placed far back; in all but one group short and the tarsus laterally compressed. Tibia not feathered to the knee. Feet webbed; hind toe small, moderately elevated.

Of stout form. Tongue thick and fleshy. Sternum with a single notch in each half of the posterior margin. Nidificating on the ground or in holes in trees. Young autophagous.

Fam. ANATIDÆ.

Bill straight from the gape to the tip, which is suddenly bent down in the form of a pointed nail, of nearly equal width throughout; under mandible shorter than the upper, and fitting inside the lamellate edges of the latter. Wings pointed, furnished with a spur in some. Tail short, varying in the number of feathers. Legs short; tibia feathered nearly to the knee. Tarsus scutellate in front. Feet fully webbed; hind toe in some furnished with a membrane.

Of natatorial habit. Sternum with a deep oval-ended notch in each half of the posterior margin.

Subfam. ANSERINÆ.

Bill high at the base, exceeding its width there; culmen sloping down to the tip, not narrower at the base than at the tip. Legs longer, and placed further forward than in the next subfamily; feathered nearly to the knee in most genera.

Head usually small; neck long in most.

Genus SARCIDIORNIS *.

Bill short; base of the culmen flat, the ridge between the nostrils narrow; nostrils rounded, pervious, placed in a depressed membrane; nail large and prominent; lamellæ in both mandibles wide apart and shallow. Wings pointed, 1st and 2nd quills subequal and longest, furnished with a prominent tubercle beyond the point. Tail of 12 feathers, rather long, rounded. Tarsus shorter than the middle toe, with stout anterior scutes.

Bill in the male with a high stiff comb.

SARCIDIORNIS MELANONOTUS.

(THE INDIAN COMB-GOOSE.)

Anser melanonotus, Forst. Ind. Zool. p. 21, pl. 11 (1781).
Sarcidiornis melanotus (Penn.), Blyth, Cat. B. Mus. A. S. B. p. 302 (1849).
Sarkidiornis melanonotus (Penn.), Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 268; Jerdon,

* I place this bird and the following species among the Geese, as I cannot consider them as belonging to the true Ducks (Anatinæ). In so doing I follow Jerdon, who, however, places the first in a separate subfamily, Plectropterinæ (" Spurred Geese "). The Black-backed Geese (*Sarcidiornis*), examples of which may be seen at the Zoological Gardens, are thorough Geese in their structure, deportment, and walk, not possessing the smallest resemblance to the true Ducks.

B. of Ind. iii. p. 785 (1864); Holdsw. P. Z. S. 1872, p. 479; Hume, Nests and Eggs, iii. p. 636 (1875); Legge, Ibis, 1875, p. 407; Butler & Hume, Str. Feath. 1876, p. 27.

Sarkidiornis regia, Eyton, *apud* Kelaart, Prodromus, Cat. p. 136 (1852).

Sarcidiornis melanonotus (Penn.), Hume, Str. Feath. 1879, p. 114 (List B. of Ind.).

Die schwarzrückige Gans, Forster, *l. c.*; *Oye de la côte de Coromandel*, Buff. Pl. Enl. 937; *Black-backed Goose*, Jerdon; *Comb-Duck*, *Spurred Duck*, Sportsmen. *Nukhta*, Hind.; *Sutu chilluwa*, Telugu; *Mukan-Tàra*, Ceylonese Tamils.

Kabalittia, Sinhalese.

Adult male (India, breeding-season). Wing 15·3 inches; tail 6·0; tarsus 2·7; middle toe 2·7, its claw (straight) 0·5; bill to gape (straight) 2·5, height at base 1·2; height of comb 1·8, length at base 2·0. The comb rises from the forehead, its base extending to within 0·3 inch of the nail; it is very much smaller at other times.

Iris dark brown; bill black; comb black; "legs and feet greenish plumbeous" (*Jerdon*).

Head, neck, throat, and entire under surface white, shading into cinereous grey on the flanks; the feathers of the forehead tipped with black so deeply as to hide the white bases; those of the crown less so: a black bronzed stripe extending from the nape down the hind neck, but not to the lower edge of the white, and thence towards the sides of the chest; and as far as this extends the feathers on the sides of the neck are spotted with black; back, wings, and tail glossy green-black, highly illumined on the wing-coverts and secondaries, which have a combined metallic coppery lustre as well; primaries slaty black; middle of the back brownish grey, blending into the metallic colour of the rump; tail blackish brown; sides of the rump from the coverts to the thighs brown; axillaries black; under wing brownish black.

Female (Ceylon: Brit. Mus.). Wing 11·5 inches; tail 4·5; tarsus 2·0; middle toe 2·2; bill to gape (straight) 2·0; comb absent.

Similar to the male, but the colours of the upper surface less brilliant, and the back and rump whitish, passing into grey on the upper tail-coverts; the neck blacker than in the male; the brown patch at the sides of the rump not present.

Obs. Von Heuglin unites the South- and North-African form (*S. africana*, Eyton) with the Indian; but other authors hold it to be distinct from *S. melanonotus*. I have not met with any African specimens, and am therefore unable to offer any personal opinion on the subject. The Indian bird is said to be larger than the African; and the director of the Cape-Town Museum, in writing to the Secretary of the Zoological Society on the subject, among other points of difference, notes that the white of the neck encroaches on the back between the shoulders, and that the lower part of the back is dirty whitish grey. A right determination, however, cannot be arrived at until a series of specimens from both localities have been carefully compared; and this, so far as I can ascertain, has not yet been done. The wing-dimension, according to Von Heuglin, of North-east African specimens is 13·0 to 14·0 inches.

The American Black-backed Goose, *S. carunculata*, Licht., differs from the present species in being larger, in having the flanks black, the secondaries more highly bronzed, and the tail longer, the latter point being noticeable on comparing the living specimens of the two species in the Zoological Gardens.

Distribution.—The "Comb-Duck" is more common in Ceylon than is generally supposed by those who have not visited the forest wilds of the island. Though nowhere numerous, it is found here and there in jungle-begirt tanks in the north and east, and no doubt wanders about a good deal, as it is said to do in India, repairing to the most secluded spots to breed, and afterwards affecting some of the larger and wilder sheets of water throughout the forests and near the sea-shore. Layard speaks of it as not uncommon on the tanks of the Vanni; and Mr. Parker writes me that it is tolerably common, but not plentiful, in the North-western Province and in the Anaradhapura district, frequenting the Madewatchiya and other tanks. It is found at Mullaittivu and at Toopoor, south of Trincomalie. In the Batticaloa district it affects the Ambaré, Irukkaman, and other tanks; and Mr. Fisher, C.C.S., met with it near Yāla, and found it breeding there. It likewise affects Tissa-Maha-Rama tank, and is found, I believe, at Urubokka and other tanks near Tangalla. This bird was first described from Ceylon by Forster, who erroneously states that it is common in the hills.

In India it is said to be rare in the south, moderately common during the rainy season, and also in the Deccan (*Davidson*); found in various districts between the Ganges and the Godaveri, where it is recorded from Lohardugga, Sirguja, Sambalpur, Nowagarh, Karial, and Raipur (*Ball*). It is not uncommon in the cold weather about Calcutta, but is migratory to the North-west Provinces, where Mr. Hume states that it breeds. Westward towards Sindh it is plentiful in certain districts, though it has only recently been obtained *in* that province. It is found in Jodhpore and in Oodeypore at the Kunkrowlee lake, where Mr. Hume met with it in flocks; it is also recorded from Cutch and Kattiawar, and occurs occasionally at the Sambhur Lake. Eastward of Calcutta it is not generally common, for though Blyth notices it as such in Burmah, and Captain Wardlaw Ramsay found it breeding at Tonghoo, it has not been met with in Tenasserim, and does not extend into the Malay peninsula.

Should the African species be indisputably united with the present, it will extend the range of the Black-backed Goose from North-east Africa to the Zambesi river and Cape Colony, and thence up the west coast to Senegal and Gambia.

Habits.—This Goose associates in small parties varying from four to a dozen individuals, and chiefly frequents tanks in which there is much overgrowth—grass, weeds, rushes, &c. Mr. Parker informs me that he has generally found it shy; but in India, according to Jerdon, it is not a particularly wary bird. It is sometimes found there in paddy-fields and on very small tanks and water-holes, as is the case in the Eastern Province in Ceylon. Mr. Fisher informs me that the young when frightened take to the jungle, and hide themselves so expeditiously that it is impossible to find them. Its flight is heavy, and when walking it is an ungainly bird, its heavy-looking head and broad tail, combined with its rather awkward gait, lifting its feet high and taking rather long strides, give it any thing but a graceful appearance. Its note, as I have heard it in the Zoological Gardens, is a low guttural quack-like sound, between the voice of a Duck and a Goose. When wounded it is said to dive well. It feeds on grain, grasses, vegetable matter procured in the tanks it frequents, and seeds of water-grasses, a remarkably hard quadrangular variety of which Col. Sykes found in the stomachs of Deccan specimens.

Nidification.—In Ceylon this Goose breeds, I understand, in February and March; but in India, according to Mr. Hume, the breeding-time in the North-west Provinces is in July and August. It makes a nest of "sticks, dead leaves, grass, and feathers, at no great height from the ground, either in some large hole in the trunk of a tree, or in the depression between three or four great arms where the main stem divides, at a height of from 6 to 10 feet." Very rarely it is placed on the ground among reeds and sedge. Mr. A. Anderson, in some interesting notes contributed to the 'Ibis,' 1874, says that the male bird assists the female in the selection of the site; and he has seen them flying into trees together, the male uttering a harsh grating noise. He has also found the nests in holes in old ruined forts. The eggs appear to vary from seven to twelve; but Mr. Anderson states that fifteen to twenty have been brought to him; and on one occasion a female was captured on her nest containing forty eggs: the nest-hole was in a banyan 30 feet above the ground, and was 3 feet deep and 2 in circumference; the eggs were laid several tiers deep; and, judging by the emaciated condition of the bird, did not appear to have been the produce of other individuals. The eggs are regular ovals, only slightly more pointed at one end than the other, delicate ivory-white and very highly polished; they vary from 2·22 to 2·48 by 1·65 to 1·75 inches.

Genus NETTAPUS.

Bill small, very high at the base, narrowing towards the tip; nostrils oval, placed close to the culmen; nail gently curved; lamellæ distant, except at the base, where they narrow and change their direction. Wings lengthened, pointed; 1st quill considerably the longest; tertials lengthened. Tail broad, cuneate, of 12 feathers. Tarsus much shorter than the middle toe. Feet large, claws much curved.

Of diminutive size.

NETTAPUS COROMANDELIANUS.

(THE GREEN-BACKED GOOSE-TEAL.)

Anas coromandeliana, Gmel. ed. Syst. Nat. i. p. 522 (1788).

Anas girra, Lath., *apud* Gray, Ill. Ind. Zool. ii. pl. 68 (1832).

Dendrocygna affinis, Jerdon, Cat. Madr. Journ. 1840, xii. p. 219 (winter dress).

Nettapus coromandelianus (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 302 (1849); Kelaart, Prodromus, Cat. p. 136 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 269; Jerdon, B. of Ind. iii. p. 786 (1864).

Nettopus coromandelianus, Hume, Str. Feath. 1878, p. 486 (B. of Tenass.), et 1879, p. 114 (List of Ind. B.).

Nettapus coromandelicus (Gm.), Hume, Nests and Eggs, iii. p. 638 (1875).

Anserella coromandeliana (Gm.), Holdsw. P. Z. S. 1872, p. 479; Legge, Ibis, 1875, p. 407.

Coromandel Teal, Lath.; *Sarcelle de la côte de Coromandel*, Buff. Pl. Enl. 949, 950; *Girra Teal*, Gray & Hardw.; *The Cotton-Teal*, *Green-backed Teal*, *Rice-Teal*, Europeans; *Pigmy Goose* of some. *Girja*, *Girri*, Hind.; *Ghangerel*, Bengal.; *Rajah-Tara*, lit. "King-Duck," Ceylonese Tamils.

Mal-Saaru, lit. "Flower-Teal," Sinhalese.

Adult male and female (Ceylon). Length 12·5 to 13·0 inches; wing 6·4 to 6·8; tail 3·0 to 3·2; tarsus 1·0 to 1·1; bill, gape to nail (straight) 1·15 to 1·2.

Iris crimson or red (variable in hue); bill greenish black, pale at base of upper mandible, and yellowish fleshy at base of lower; tibia and exterior of tarsus with the webs brown, inside of tarsus, toes, and part of web adjacent yellowish olive.

Breeding-plumage. Forehead, centre of head, and nape blackish brown, the feathers often pale-tipped; rest of head, neck, breast, and all beneath to the vent white; a black ring, tinged above with green, completely encircling the hind neck and lower fore neck, the feathers above it with the bases brownish, and the flanks stippled openly or "dusted" with brown; back, scapulars, tertials, and wing-coverts dark metallic green, the bases of the back and scapulars glossy purple, this colour predominating in parts, and changing on the rump into a duller greenish and purple tint; secondaries fine metallic green, with the terminal half-inch white; primaries (mostly) and their coverts green-black, the middle part of the longer feathers being white, which extends across and includes the tips of the inner ones; shorter upper tail-coverts brown, paling to greyish on the longer, the whole stippled with small dots: tail brown, with a greenish gloss, and sometimes tipped pale; vent and under tail-coverts brown, the basal half of the feathers white; axillaries and under wing dark green.

Male in winter (November). Differs from male in summer in having the hind neck brownish, and in having a zone of transverse marks or bars across the front and sides of the neck, instead of the dark band; the feathers here are

barred with black, chiefly on the concealed parts; face faintly striated with brown, and a brown stripe from the bill to the eye, continued a little from the posterior edge; upper surface browner than in summer, particularly as regards the scapulars, which have a bronzed lustre, but scarcely any green hue; under tail-coverts white.

Female. I have no examples of this sex in my collection, nor have I examined any in England, as the bird is not by any means common in museums. The following is Jerdon's description:—"Duller and more brown, above faintly glossed, the primaries want the white patch, the sides of the rump and upper tail-coverts are pale brown; the top of the head is dusky, and there is a dark stripe through the eyes; the neck is mottled with dusky lines; the underparts are dirty white; the flanks pale brown, and under tail-coverts whitish."

Young covered with black down.

Obs. Examples from Futtehgurh in my collection measure in the wing 6·5 to 6·7 inches; tarsus 0·95; middle toe (without claw) 1·5, bill to gape 1·1. These measurements correspond with those given by Mr. Cripps of Furreedpore specimens, whose weight he records as 9·75 to 10·87 oz. Other members of this interesting genus are *N. pulchellus*, Gould, and *N. albipennis*, Gould, from Australia. The former, which is a beautiful species, differs from our bird in having the head and nape brown, with a large white patch below the ear-coverts; the feathers of the fore neck and its sides are handsomely marked with black lunulations, which extend down the flanks; secondaries white, forming a bar across the wing. Wing of males 6·25 to 7·0 inches.

Distribution.—This pretty little bird is common on the tanks of the northern and eastern parts of the island, breeding in many secluded spots, and moving about considerably during the rainy weather. To the Western Province and south-west of the island it is apparently chiefly a N.E. monsoon migrant, as about Christmas-time it is met with on Kotte and Kæsbawa lakes and other similar sheets of water. On the Bolgodde Lake it is doubtless found throughout the year, and I have received it from Amblangoda in September. I have seen it at nearly all the tanks I have visited in the Eastern Province, and northward from Kurunegala to Trincomalie. In the North-western Province, and in the neighbourhood of Anaradhapura it is particularly plentiful; and at Kanthelai and Minery I have met with large flocks. In wet weather it may be found in flooded lands even near the sea-shore.

The "Cotton-Teal" is found all over the low-lying districts of India, except the Provinces of Sindh, Jodhpur, and the surrounding region, although even in this part it is met with in Kattiawar and Northern Guzerat. In the Deccan it is moderately common at both seasons of the year, is plentiful in all parts of Chota Nagpore, and recorded from many places between the Mahanadi and the Ganges by Mr. Ball. In Furreedpore it is abundant during the rains, breeding there, and some remaining in the cold season. In the neighbourhood of Calcutta it is extraordinarily numerous, as many as 500 having been brought into the market in one morning. In Pegu it is very common; Captain Wardlaw Ramsay procured it at Tonghoo; and in the Province of Tenasserim it is confined to the central portions, while further north it has been observed in the tracts west of the Sittang. It is met with further south in the Malay peninsula, as the Calcutta Museum has been enriched by specimens from that region. It has likewise been found in Java. In the Andamans it is uncommon, having only been procured as yet in the island of South Andaman, and rarely there. Eastward of Burmah it is found in China in small numbers during the summer, and extends thence to the Philippines, where it has been procured in Luzon. Returning to the Indian Empire, we find it breeding in the Jhansi district. Then further west in the dry region of Rajpootana, as has been remarked, it is absent, reappearing again in Kattiawar and Guzerat, in which districts it finds a home on rushy and weedy tanks.

Habits.—The Green-backed Goose-Teal frequents tanks and jheels which are overgrown with weeds, and flanked with reed-beds and sedge-growth, in preference to open water; in such places, where it may be seen in small flocks of six to ten, feeding at some distance apart, it generally affects the deep water at the edge of the weedy tracts, swimming slowly along, and feeding on vegetable matter and larvæ, which it takes from the floating leaves; it is loath to rise when approached, and will permit itself to be approached by a sportsman wading into the water within gunshot. When fired at the flock generally flies round the tank once or twice, and then realights, often among lotus-leaves, as if the birds knew that it was almost impossible to distinguish them in such a position. Occasionally, however, when a bird is wounded, its fellows do not even rise if they

only number one or two, but swim off a little way and remain motionless, while their injured companion sinks below the water with nothing but the bill above the surface, so that it is impossible to find its whereabouts. I have only heard their note in the evening, when they are more restless than usual, and often get on the wing and fly round the tank, uttering a weak cackling note. In the breeding-season it is said to be more noisy; and the late Mr. Anderson remarks that its call has been likened to the words "fix bayonets!" whilst Jerdon says that it resembles that of a Grouse. It flies very swiftly, with quick-beating of the wings. This bird is much admired by the Singhalese, who prefix the word *Mal* (flower) to the ordinary name *Saaru* (duck) on account of its beauty. Its flesh is very good eating. According to Blyth it cannot walk well, but shuffles along and squats on the ground.

Nidification.—In the northern parts of Ceylon the Green-backed Teal breeds in the early part of the year. In the Anaradhapura district, as I am informed by Mr. B. Price, of the Public Works Department, the natives take their eggs and hatch them under small hens. The nest is made in holes in the limbs of large trees or even on old buildings, and is occasionally placed on the ground among rushes. Some observers say that there is scarcely any lining in the holes, whilst others have found feathers plucked from the birds' breasts in their nests. Mr. F. B. Blewett, writing to Mr. Hume from Jhansi, says that the "Cotton-Teal" makes a semi-floating nest on the water in that district in July and August, constructing it of lotus-leaves, weeds, grass, &c., piled up several inches above the surface. The number of eggs varies from 8 to 12, or sometimes, according to Jerdon, to 15; they are oval in shape and delicate ivory-white, being very smooth in texture. According to Mr. Hume they vary from 1·54 to 1·75 inch in length, and in breadth from 1·17 to 1·38 inch. Mr. A. Anderson observes that both birds assist in selecting a habitation; he once watched a pair which flew into a tree together, and while the female used to enter the hole the male sat on a bough watching for her exit.

Genus DENDROCYGNA *.

Bill high at base, as in the last genus; ridge between the nostrils narrow; upper mandible of uniform width; nail suddenly bent down; lamellæ prominent and narrow. Wings short, rounded, the 2nd, 3rd, and 4th quills subequal and longest; tertials exceeding the primaries; a small tubercle at the point of the wing. Tarsus stout, shorter than the middle toe; hind toe rather long.

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* The "Tree-Ducks" are a peculiar group, placed by some authors among the Anatinæ, or true Ducks, and by others in the Tadorninæ, which may be considered to be a section of Anserinæ. Although their habits are somewhat abnormal, they grade into the Geese through the two preceding genera; and in view of their short, high bill and rather lengthened, forward-placed legs, I prefer to class them with the Geese rather than with the Ducks.

DENDROCYGNA JAVANICA.

(THE INDIAN WHISTLING-TEAL.)

Anas javanica, Horsf. Trans. Linn. Soc. 1821, xiii. p. 199.

Mareca awsuree, Sykes, P. Z. S. 1832, p. 168.

Dendrocygna arcuata (Cuv.), *apud* Blyth, Cat. B. Mus. A. S. B. p. 301 (1849) (in part); Kelaart, Prodromus, Cat. p. 136 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 269; Hume, Nests and Eggs, iii. p. 639.

Dendrocygna awsuree (Sykes), Jerdon, B. of Ind. iii. p. 789 (1865).

Dendrocygna javanica (Horsf.), Holdsw. P. Z. S. 1872, p. 479; Legge, Ibis, 1874, p. 27, et 1875, p. 407; Hume, Str. Feath. 1878, p. 486 (B. of Tenass.), et 1879, p. 114 (List B. of Ind.).

Whistling-Teal, *Tree-Duck* of some. *Silli*, Hind.; *Saral*, Bengal; *Harrili Hans*, East Bengal (Jerdon); *Meliwis batu*, Horsf.; *Chemba-Tara*, Ceylonese Tamils.

Tatta-Saaru, *Saaru*, Sinhalese.

Adult male (Ceylon). Length 16·8 to 17·5 inches; wing 7·8 to 8·0; tail 2·4; tarsus 2·0; middle toe and claw 2·8 to 2·9; bill to gape (straight to tip of nail) 2·0.—*Female.* Length 16·3 to 16·8 inches; wing 7·5.

Iris brown; orbits yellow; bill blackish leaden; legs and feet dark plumbeous.

Forehead, crown, lores, hind neck, and interscapular region wood-brown, gradually changing into the dark slaty of the scapulars, back, tertials, and median wing-coverts; the shafts of the head-feathers spinous, and the lower hind neck and upper back broadly edged with yellowish grey and rufous yellow respectively, the latter continued down on the scapulars; lores, face, sides of head, and the neck dusky whitish, paling into albescent on the gorge, and passing into the fine ruddy chestnut of the whole breast and underparts (specimens when newly moulted have a yellowish gloss on the chest); lesser and succeeding row of wing-coverts maroon-red; quills brownish black; upper tail-coverts ferruginous chestnut; tail umber-brown, edged with buff-yellow; under tail-coverts, sides of lower back, and rump dusky buff-yellowish, the basal portions of the coverts with dark interrupted bars; under wing-coverts glossy black.

Female. Has the underparts less ruddy or paler than the male.

Obs. Examples from various parts of India (including Nepal) and Java correspond with Ceylonese specimens in coloration and dimensions. A Nepal specimen measures in the wing 7·7, a Javan 7·3 inches. Mr. Cripps gives dimensions of males as follows:—wing 7·50 to 8·04 inches, tarsus 1·9 to 1·92, bill from gape 1·8 to 2·06. Nicobar specimens are, according to Mr. Hume, identical with Indian.

D. arcuata, Horsf., is another species of this genus, extending from Java to Australia, and is conspicuous for the coloration of the flank-feathers and the head and neck. The crown and centre of the hind neck are brownish black, and the sides of the neck and face buff-white; the upper tail-coverts are *buff-yellow* at the sides; flank-feathers white, with broad black margins.

D. fulva, Gm., is larger than the last species; flank-feathers and hind neck differently coloured.

The following diagnosis of these three forms of *Dendrocygna* may be useful to local students:—

D. javanica. Head wood-brown; no stripe down hind neck; upper tail-coverts chestnut, black in the middle; breast unspotted: wing 7·2 to 8·0 inches.

Habitat. India, Burmah, Java.

D. arcuata. Head dark brown; dark stripe down hind neck; upper tail-coverts buff at the sides, black in the middle; breast spotted; flanks striped, the feathers buff-white, bordered with black: wing 7·5 to 8·3 inches.

Habitat. Java, Malay archipelago, to North Australia.

D. fulva. Head chestnut-brown; black stripe down hind neck; upper tail-coverts buff, black in the middle; centre of the neck striated; flanks striped, the feathers buff-white, bordered with cinnamon-brown: wing 9·0 inches.

Habitat. India, also Madagascar and parts of South America.

Distribution.—The Whistling-Teal is by far the commonest of the Duck tribe in Ceylon, and in some localities is very numerous at certain seasons of the year. It frequents almost every tank, both large and small, in the northern and eastern forests, being met with sometimes on quite small village ponds. I have not seen it on brackish estuaries or salt lagoons, and believe it to be exclusively a freshwater species. In the west of Ceylon, where the country is devoid of artificial irrigation-waters, it frequents the rivers and paddy-fields in their vicinity; on the Bentota river, the Gindurah ganga, the Nilwella ganga or Matara river, and other estuaries it is to be found, more especially in the latter part of the year, keeping to those parts which flow through a large extent of paddy-land; and on the first-named river excellent Teal-shooting is to be had

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Genus TADORNA.

Bill somewhat similar in form to that of *Dendrocygna*; sides not so flattened; lamellæ well developed, descending below the edge of the mandible. Wings with a blunt projection just beyond the flexure. Tail short, rounded, of 14 feathers. Legs moderately long; hind toe slightly lobed.

Of large size and conspicuous coloration.

TADORNA CASARCA.

(THE RUDDY SHELDRAKE.)

Anas casarca, Linn. Syst. Nat. iii. App. p. 224 (1768).
Anas rutila, Pall. Nov. Comm. Petrop. xiv. p. 579 (1770).
Casarca rutila (Pall.), Blyth, Cat. B. Mus. A. S. B. p. 303 (1849); Jerdon, B. of Ind. iii. p. 791 (1864); Hume, Str. Feath. 1873, p. 260, et 1879, viii. (List B. of Ind.), p. 115; Scully, ibid. 1876, p. 198.
Tadorna casarca, Dresser, B. of Eur. pt. 41 & 42 (1875).
The Brahminy Duck in India; *Surkhah, Chakwa, Chakwi*, Hind.; *Chakra-baka*, Sanscrit; *Bapana chilluwa*, Telugu (Jerdon); *Hangghut*, Turki (Scully).

Adult male (India, Spain). Wing 14·0 to 15·2 inches; tail 5·4 to 5·6; tarsus 2·4 to 2·5; middle toe 2·3 to 2·4, claw 0·45; hind toe (without claw) 0·5; bill to gape (straight) 2·0 to 2·2.

Female. (Seville) Wing 12·7 inches; tail 4·8; tarsus 2·1; middle toe 2·1; bill to gape (straight) 1·9. (Yarkand) "Length 24·0 inches; wing 13·75; tail 5·8; tarsus 2·25; bill from gape 2·0: weight 2 lb. 13·5 oz." (*Scully*).
Iris deep brown; bill, legs, and feet black.

Male (Seville). Head and neck creamy buff, paling on the forehead and face, and darkening on the lower hind neck into the rather light rufous-tawny of the interscapular region, scapulars, chest, under surface, and flanks; a broad ring of black glossed with purple round the neck; the underlying scapulars brownish, mottled with greyish buff; lower part of back vermiculated with brown; rump and upper tail-coverts deep black; tail and primaries dull black; secondaries blackish brown, the terminal portions of the outer webs dark metallic green; the inner webs whitish, except near the tip; wing-coverts white (in some white, washed with creamy buff); tertials rufous-tawny, paling to whitish at the tips, the inner webs brownish; axillaries and under wing-coverts white.
Some males apparently in adult plumage have no collar; this, in a specimen kept in confinement by Mr. Cripps, was not put on until after the hot season.

Adult female (Seville). Face and sides of head whiter than in the male; top of the head washed with brown; no ring round the neck; back darker than in the male, the lower part being brown, vermiculated with greyish buff; otherwise as in the male.

Nestling in down (Volga). Top of the head, down the hind neck, back, tail, and a band on the primaries light brown, the tips of the down being tawny; forehead, face, all the neck but the aforesaid black band, entire underparts, posterior part of the wings, and a stripe down the sides of the back, commencing behind the wing, sullied white.

in September and October. It is found on Kotte and Kæsbawa lakes occasionally, and large flocks are to be seen at the latter end of the year on the upper or freshwater part of the Bolgodde Lake. At the lower end of the Batticaloa Lake it is also abundant at certain times.

This species is very abundant in parts of India, extending into Burmah, Tenasserim (where it is common), and Malacca, and thence southward to Java, whence it was first procured and described by Horsfield. It is likewise abundant at the Nicobars; but in the Andamans it has only recently been procured. In regard to India, I find that it is plentiful in parts of the Deccan, chiefly about wooded districts in the rains and cold weather (*Davidson*); found throughout Chota Nagpur, and recorded especially in that district from the

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Young of the year resemble the female; the scapulars are brownish, mottled with rufescent, and the wing-coverts, more especially the greater series, are tinged and tipped with brownish.

A male (so labelled) from Calcutta, dated December, has no ring round the neck; the wing-coverts show no signs of immaturity; but it is probably a bird of the year.

Distribution.—In accordance with the rule adopted in this work, I place this species in a footnote, specimens never having been actually procured and preserved; but I have little doubt of its occurrence in the island, for an account of which I am indebted to Capt. Wade-Dalton, of the 57th Regiment, who is well acquainted with the bird. He met with a pair in February 1876 in the long lagoon which runs inland from Mullaittivu, and writes to me as follows:—"I saw them sitting at the edge of the water, and stalked and shot at them with an 8-bore belonging to a friend; but, thanks to the bad powder in the cartridges, I failed to bag either." As it is, according to Jerdon, a cold-weather visitant to all parts of India, there is no reason why it should not unfrequently stray down to Ceylon. It is common in the Deccan, and is said to remain there until May, the end of the hot weather (*Davidson*). It is very abundant in Sindh, and breeds on the Upper Indus in May (*Hume*). To the valley of Nepal it is a winter visitor, but leaves in December (*Scully*). It is found in Kashgaria up to an elevation of 16,000 feet, and extends into Mongolia, where it is common and held sacred by the inhabitants (*Prjevalsky*). It is not uncommon in Persia, ranging as far north as lat. 50°, and eastwards to the Baikal region, and thence to Japan. On inland waters in China it is not unfrequent; but it is rare on the coasts. It winters in Palestine, and also breeds there occasionally. In Europe it chiefly inhabits the south (though rare in Italy), breeding in Spain and Southern Russia. It is a straggler to Northern Europe as high up as Sweden (*Nilsson*), and strays still northward into Finland. To Great Britain it is a rare straggler. It inhabits Northern Africa, occurring in Morocco, Algeria, and Egypt, breeding in the latter country; and it is said to extend southwards as far as the Blue Nile.

Habits.—This Sheldrake is met with usually in pairs or small troops of half a dozen or more, but is said in India before migrating to assemble in thousands. It is a very well-known bird in that country, being universally called the "Brahminy Duck." "The Hindoos," writes Jerdon, "have a legend that two lovers for some indiscretion were transformed into Brahminy Ducks, that they are condemned to pass the night apart from one another on opposite banks of the river, and that all night long each in its turn asks its mate if it shall come across; but the question is always met in the negative—'Chakwa, shall I come?' 'No, Chakwi.' 'Chakwi, shall I come?' 'No, Chakwa.'" Its note as heard by me in confinement is a low guttural *kape*, *kape*, *kape*, and sometimes *ka*, *ka*, *ka*, *khap*, quickly repeated. It walks well, with the same action as the true Geese, and is said to graze, like these birds, in corn-fields. It has been said by a writer in the 'Indian Sporting Review' to devour carrion in company with Vultures; but Jerdon states that he was constantly on the watch to verify this observation, "but never saw any thing approaching to such a habit."

Nidification.—This handsome bird does not seem to be particular as to the site which it chooses for its nest, so long as it appears to afford it the necessary cover. It nests in hollow trees, hollow logs, clefts of rocks, or caves, in which latter locality Canon Tristram found a nest among those of some Griffon-Vultures; and in Mongolia, where it is never molested, besides resorting to holes and clefts in the ground, it sometimes lays in the "fireplaces of villages deserted by the Mongols," in which, writes Col. Prjevalsky, "the females, whilst hatching, get almost quite black with soot." This author says that though the male does not assist in incubating, as soon as the young are hatched he is most vigilant in watching them. The breeding-time of this species, both in Asia and Europe, is in May and June. The eggs are oval and of a pale cream-colour, not to be distinguished from those of the Common Sheldrake. These latter are ovals, somewhat stumpy at one end, smooth, and rather glossy in texture. Specimens before me measure 2·59 by 1·88 and 2·69 by 1·91 inches.

Rajmehal hills, Manbhum, Lohardugga, Sirguja, Sambalpur, Orissa, Nowagarh, and Karial; abundant near Calcutta, and common in the rainy season near Furreedpore. In the North-west Provinces it also appears to be plentiful during the rains; but at other seasons of the year it is, according to Mr. Hume, not so often seen. He speaks of it breeding in Mynpooree, Cawnpoor, Muttra, Allyghur, and Meerut. Further west it is not very common, being found in certain localities in Guzerat, Cutch, and Kattiawar; and in Sindh and Jodhpoor it is very rare, never having been found at the Sambhur Lake.

As it is abundant in the Nicobars and is also found in Java, it is doubtless an inhabitant of Sumatra.

Habits.—This Whistling-Teal or Tree-Duck is essentially gregarious, rarely associating in flocks of less than a dozen; and when not breeding congregates at times in large numbers. It frequents weedy, rushy tanks, and is partial to those which are surrounded by forest. It is fond of spots which are overgrown with Lotus-leaves, no doubt finding an abundance of aquatic insects in such situations. I have generally found it moderately shy, not permitting a very near approach; but when put on the wing it flies round and round the tank or swamp, often passing within shot, and uttering all the time its sibilant whistle until it realights. Although resorting to trees, on the outspreading branches of which they frequently perch in the breeding-season, they are seldom to be seen in such a position at other times of the year; but I have seen them sitting on the dead horizontal branches of partially submerged trees, and on low rocks standing out from the water in the middle of the tank. They resort in the Western Province to the paddy-fields during harvest-time, and feed on rice, then affording good shooting, as their flight, though performed with quick beatings of the wings, is not swift, and they are easy birds to bring down. Although this species, like other members of its family, is to a certain extent granivorous, it also feeds on insects, many of which I have taken from its stomach mixed with a quantity of gravel. The young are fed on insect-diet, as Capt. G. Marshall speaks of a nest he found swarming with ants and maggots; they are probably taken down to the water from the nest on the backs of their mothers, as is the case with other species.

Nidification.—In the west of Ceylon the Whistling-Teal breeds from June until August; but in the northern forests its eggs have been taken in the early part of the year, after the cessation of the north-east monsoon rains. It sometimes builds on the ground among rushes or tussocks, and even in reeds, the nest half floating in water; but it usually selects a hole in a tree, or the fork of two large trunks, and not unfrequently the old deserted nest of a Crow, Kite, or Heron. Trees close to the water's edge are chosen to facilitate the taking of the young to it; sometimes the nest is lined with grass and feathers, but in other instances there is no lining whatever. The maximum number of eggs appears to be fourteen; sometimes ten and twelve complete a clutch. They are pure white, without the gloss characteristic of the eggs of the last species, although their texture is smooth. They are broad ovals, slightly larger at one end than the other. A specimen before me, taken by Mr. H. Parker in the Uswewa district, measures 1·83 by 1·41 inch.

In India it lays from June until the beginning of September; many interesting notes are furnished in 'Nests and Eggs' from Mr. Hume's correspondents, among which I may cite Captain G. Marshall's assertion of having shot a male of a pair, and finding the female provided with another mate on the following day. Again, Mr. Anderson speaks of a friend taking a clutch of twelve eggs from a nest in a date-palm on the 29th of June, and finding fourteen eggs in the same nest on the 13th of July; so that the female must have laid the first egg of the second batch the day after the removal of the first. Mr. Hume finds that the eggs vary from 1·72 to 2·0 inches in length, and from 1·4 to 1·6 in breadth.

Note.—My correspondent Mr. Parker writes me of a large Goose which he has met with on some of the most secluded tanks in the North-western Province; and Mr. F. Fisher informs me that he has also seen a Goose on the wing flying in flocks along the north-west coast. Mr. Parker describes the bird he has noticed as a dark grey, dark-backed Goose; and I am not aware what the species can be but the Grey-Lag Goose of Europe, which visits the north of India largely, straying in limited numbers towards the south. This Goose (*A. cinereus*) measures about 30 inches in length, wing 17 to 18·5; bill fleshy red, with a pale tip; legs and feet fleshy red. Plumage very similar to that of the Domestic Grey Goose.

ANSERES.

ANATIDÆ.

Subfam. ANATINÆ.

Bill longer than in *Anserinæ*, not so high at the base, where it is narrower than near the tip; both mandibles furnished with lamellæ. Wings pointed; the tertials lengthened. Tail variable in the number of feathers. Legs short, set far back. Feet fully webbed; the hind toe not webbed.

Sexes differing in plumage for the most part; the male assuming the dress of the female in the autumn; with a brilliant wing-band or speculum.

Genus ANAS.

Bill at the gape slightly narrower than near the tip; the nail perpendicular and short; lamellæ well developed; nostrils oval, pervious, placed close to the culmen. Wings with the 1st quill equal to or longer than the 2nd. Tail with the centre feathers variable; of 14 to 16 feathers. Tarsus shorter than the middle toe, covered with transverse scutes in front. Claws straight.

ANAS PŒCILORHYNCHA.

(THE SPOTTED-BILLED DUCK.)

Anas pœcilorhyncha, Forster, Ind. Zool. pl. 13, p. 23 (1781); Gray & Hardw. Ill. Ind. Zool. pl. 67 (1833–34); Blyth, Cat. B. Mus. A. S. B. p. 304 (1849); Kelaart, Prodromus, Cat. p. 136 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 269; Jerdon, B. of Ind. iii. p. 799 (1864); Holdsw. P. Z. S. 1872, p. 479; Legge, Ibis, 1875, p. 407; Hume, Str. Feath. 1879, p. 115 (List B. of Ind.).

Mareca pœcilorhyncha, Steph. *apud* Sykes, P. Z. S. 1832, p. 168.

Anas pœkilorhyncha, Gm. *apud* Hume, Nests and Eggs, iii. p. 643 (1875).

The Indian Wild Duck, Grey Duck of some. *Garm-pai*, Hind., also *Bata*.

Adult male and female (Futtehgurh). Wing 10·3 to 10·9 inches; tail 4·6 to 5·0; tarsus 1·7 to 1·9; middle toe, without claw, 2·2 to 2·4, claw (straight) 0·3 to 0·4; hind toe 0·5; bill to gape (straight) 2·4 to 2·7, at front to bend of nail 2·0 to 2·4. A presumed male in the Poole collection, from Ceylon, measures:—wing 11·6, bill at front 2·4. Jerdon's data are—length 24·0 to 25·0, wing 12·0. The female is the smaller of the sexes.

Note.—This Duck is peculiar in having the base of the culmen naked on each side of the frontal feathers for some little distance, adding additional height to it at that part.

Male (August, Futtehgurh). Iris reddish brown; bill black, about 0·6 of the tip chrome-yellow, the nail black; base of the culmen yellow; tip of the lower mandible yellow; legs and feet orange-yellow; claws black.

Forehead, upper part of lores, top of head, crown, nape, interscapulary region, and upper scapulars sepia-brown, darkening slightly towards the tips of the scapulars, and passing into blackish brown on the rump and glossy black on the upper tail-coverts; tips of the feathers of the head, lower hind neck, upper back, and scapulars pale greyish; wing-coverts paler brown than the scapulars, tinged with slaty at the edges of the feathers, margined with white along the edge of the wing, and the greater series with velvety-black tips, and a subterminal band of white on the outer webs; primaries dark brown, the edges of the 1st pale; outer webs of secondaries metallic green, glossed

with violet, tipped with velvety black, and with narrow white extremities; inner webs brown; outer webs of the elongated tertials dull white on the terminal portions; tail deep brown, with narrow fulvous-grey margins; an indication of a pale stripe from the bill over the eye, at the posterior corner of which is a dark patch; throat, face, and neck dull whitish, the feathers with dark mesial lines, except on the chin and upper throat; chest and under surface buff-white, with sepia-brown centres to the feathers; abdomen brown, with pale edgings; under tail-coverts black; under wing and axillaries pure white.

Female (August, Futtehgurh). Bill reddish black; legs and feet greenish yellow.

Slightly paler on the back, the pale margins of the feathers broader; upper tail-coverts tipped with buff-grey; speculum not so brilliant as in the male; the white subterminal band on the greater coverts broader; the brown centres of the under-surface feathers smaller; the feathers of the abdomen and under tail-coverts edged with greyish white. A second example differs from the male in precisely the same manner; but the under-surface feathers are washed with buff, and there is a brownish-buff terminal band on the innermost greater wing-coverts.

Obs. In this species, as in the Pacific Wild Duck, *A. superciliosus*, there is no change of plumage in the male during autumn, as the dress of both sexes is so nearly alike.

I regret to say that I have no data concerning the plumage of the *nestling* or the *immature* in their first autumn. The former is probably covered with brown down above and yellowish white beneath. Full descriptions will no doubt appear in Mr. Hume's 'Game-Birds of India.'

This Wild Duck is represented in China and Mongolia by a closely-allied form with the same plumage, but with a yellow band across the bill, and which has been named *A. zonorhyncha* by Swinhoe. The beautiful Pink-headed Duck, *A. caryophyllacea*, Linn., has been found as far south as Madras, and might some day migrate to Ceylon as a straggler. The head and neck are very pale pink; plumage chocolate-brown; speculum salmon-colour, and the under wing-coverts pink. "Wing $11\frac{1}{2}$ inches, bill at front $2\frac{1}{4}$; irides fine orange-red" (*Jerdon*).

Distribution.—Although this fine Wild Duck is occasionally seen on the tanks in the north and east of the island, I have never met with it myself. During my stay at Trincomalie I heard of it as occurring at Mullaittivu; and Mr. Varian, of the Public Works Department, has observed it on several occasions on the Topoor tank. Layard speaks of it as being not unfrequently met with on tanks in the Anaradhapura district; but my correspondent Mr. Parker has not observed it there or in the North-west Provinces. I have heard of its being seen at Ambaré and Irukkamam tanks and also in the Yāla district; and further south it is said to have occurred on the Matara river. It is probably only a cold-weather migrant from the south of India, and doubtless occurs on passage in the island of Delft, which is a famous resort of Ducks.

It is spread throughout India, being very common on the plains, and extending into the lower parts of the Himalayas, and likewise into Burmah, being said by Blyth to occur in Tenasserim; but Mr. Davison has never met with it there. In the Indian peninsula it is common in the Deccan, and probably breeds there (*Davidson*), rare in Chota Nagpur, and recorded from Sambalpur, Nowagarh, Karial, Sirguja, and Manbhum. From Julpigoorie also Captain Beavan notes it. About Calcutta it is not very common according to Mr. Hume, and in the Furreedpore district it does not seem to occur. In the North-west Provinces and seemingly throughout the plains of Bengal it is plentiful, and westward ranges as far as Sindh, where it is pretty common, but not so numerous as the Mallard. At the Sambhur Lake it is resident, but most abundant during the rains; in Guzerat it is common, as also in Kutch and Kattiawar.

Habits.—The "Grey Duck," which is one of the finest members of its genus in the world, is entirely a freshwater species, frequenting tanks in wooded districts, marshes, and reedy streams, and when spread over the country in the non-breeding time is now and then found on small pools and sheets of water. It is not very gregarious, going about usually in pairs or in small flocks of less than a dozen; it is much sought after in India, owing to its size and the excellent quality of its flesh, and it affords good and easy shooting, being rather slow on the wing. Like most true Ducks, it feeds on grain, seeds, and vegetable matter procured in water, and is said to swallow gravel and small stones, which assist it in digesting its food. It is very difficult, writes Captain Butler, to procure when wounded, as it dives freely, and seldom shows more than its bill above water; it also appears to have the faculty of remaining under water a long time, as the same writer speaks of a "flapper" which was caught, after diving a considerable distance, while taking "refuge in a thick mass of weeds at the bottom of the tank, 3 feet deep, from which moist retreat he was extracted by one of the beaters, who

accidentally trod on him when walking through the water in search of one of the others!" I have, however, seen "flappers" of the Common Wild Duck remain a very long time under water. The call of this species is said to be like that of the Mallard, but not often repeated.

Nidification.—The breeding-season of the Spotted-billed Duck in India is in July and August. It usually constructs a nest of grass and rushes, lined with down and feathers, placed on the ground among rushes, long grass, reeds, or sedge. Mr. Hume, however, speaks of a nest which was placed on the drooping branch of a tree, which hung down into a thick clump of rushes in a jheel. It was about 9 inches above the water, and was firmly based on a horizontal trifurcation of the bough. Fine grass was mingled in this case with the down and feathers, which, as usual, must have been plucked by the bird from its body. The number of eggs does not appear to exceed seven; they are described as broad ovals, smooth in texture, and white or greyish white in colour. They vary in length, says Mr. Hume, from 2·08 to 2·3 inches, and in breadth from 1·65 to 1·8.

ANAS ACUTA.

(THE PINTAIL.)

Anas acuta, Linn. Syst. Nat. i. p. 202 (1766); Naum. Naturgesch. der Vög. Deutschl. xi. p. 638 (1842).

Dafila acuta (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 304 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 269; Jerdon, B. of Ind. iii. p. 803 (1864); Holdsw. P. Z. S. 1872, p. 479; Dresser, B. of Eur. pt. 19 (1873); Heuglin, Orn. N.Ost-Afr. ii. p. 1311 (1873); Scl. & Salv. P. Z. S. 1876, p. 391; David & Oustalet, Ois. de la Chine, p. 498 (1877); Hume, Str. Feath. 1879, p. 115 (List Ind. B.).

Pintailed Duck, Lath.; *Rabijunco*, Port.; *Pijlstaart*, Dutch. *Dig hans*, Bengal.; *Kokarali*, Sindh (Jerdon); *Bulbul*, Arabic (Heuglin).

Adult male (England and Siberia). Length 23·0 to 25·0 inches; wing 10·6 to 11·5; tail 6·0 to 6·5, the central feathers 2·0 to 2·3 longer than the adjacent pair; tarsus 1·5; middle toe 1·5, nail 0·43; hind toe 0·4; bill to gape (straight) 2·5, at front 2·0.—(Ceylon). Two examples: wing 10·2–10·7 inches. The central tail-feathers are attenuated, running gradually to a sharp point.

Iris orange-reddish; bill black, pale blue about the nostrils; legs and feet greyish black.

Male after the autumn moult (Yenesay, 10th June). Head and throat down to the middle of the fore neck earthy brown, the centres of the feathers dark brown, overspreading them on the centre of the head and nape, and changing on the hind neck into a black patch, passing again into the whitish of the lower hind neck, interscapulars, sides of chest, and flanks, all of which parts are very closely cross-pencilled with brownish black; at the side of the nape a white stripe passes down between the black hind neck and the brown of the throat, and spreads over the entire under surface to the vent, the belly being finely stippled with brownish; back greyish white, more closely cross-pencilled with black than the interscapulars; upper tail-coverts whitish with brown centres, the larger lateral feathers with the outer webs black; tail-feathers pale brown with whitish edges, the elongated central pair entirely black; scapulars and tertials elongated and lanceolate, the former black, with broad clearly-defined white margins, the upper or shorter feathers white, cross-rayed with blackish like the interscapulars; tertials greyish white, with broad clearly-defined black centres, some of the feathers mottled with greyish along the outer edges; wing-coverts greyish slate, with a greenish tinge, the greater series broadly tipped with salmon-colour, forming a band across the wing; secondaries brown, with broad white tips sharply defined on the outer webs against a deep black band, changing higher up the feather into coppery bronze, which is deep green in some lights, forming a brilliant speculum in the closed wing; primaries pale brown, the first quill with a whitish shaft, the remainder sullied whitish; under tail-coverts dull black, the lateral feathers with an outer white edge; axillaries whitish, with dark shaft-lines; under wing-coverts brownish grey, stippled with whitish.

The ground-colour of the tertials is brown in some specimens, and that of the upper tail-coverts brownish grey; these are probably not fully adult. The older the bird, the longer the scapular and central tail-feathers are.

This plumage is worn through the winter until *about* the latter half of the following June, when, after the pairing-time is over, the male undergoes during the month of July a complete moult, and assumes a plumage something like that of the female, with the exception of the wing-coverts, primaries, and secondaries, which are renewed as before. The dress in a male (Archangel, July 31) in Mr. Dresser's collection is as follows:—

Summer plumage. Sides of the head, throat, and upper part of neck fulvous grey, the feathers centred with brown, except on the throat; top of the head blackish brown, the feathers edged with tawny, and paling on the back of the neck into greyish brown; lower part of the fore neck and its sides, together with the under surface, sullied whitish, each feather with a brown bar near the tip, except on the breast, where the bars are reduced into small spots; flanks boldly barred with brown; lower hind neck, scapulars, and back dark brown, the feathers crossed with narrow bars of white, as also stippled with the same; upper tail-coverts brown, crossed with crescentic bars of white; tertials brownish grey, with broad mesial blackish stripes blending into the ground-colour; tail brown,

the feathers with narrow pale margins, the central pair pointed and not ½ an inch longer than the adjacent. In this specimen the primaries are only half-grown, although the rest of the plumage is perfect.

Obs. This dress is proved, by keeping the birds in confinement, to be worn until the end of September, when another equally rapid moult takes place, and by the end of November the full winter and spring plumage has been put on. The wing-coverts, primaries, secondaries, and tail-feathers, with the exception of the two centre pairs, are not moulted; but the scapulars, tertials, and above-mentioned tail-feathers are, while the remaining tail-feathers would seem to become paler and assume white edges. Naumann, who was a very accurate observer, states that only the centre pair of tail-feathers are moulted; but I find that the adjacent pair, which are much pointed and exceed the rest in the handsome dress, are not so in the summer specimen above described.

Adult female. (Petchora, Hakodadi, Wisconsin) Wing 9·5 to 10·0 inches; tail 4·5 to 4·8; tarsus 1·5 to 1·7; middle toe 1·5 to 1·8, claw 0·9; bill to gape 2·2 to 2·3. (Yarkand) "Length 21·75; wing 10, expanse 28·25; tail 4·8; tarsus 1·5; bill from gape 2·35: weight 1 lb. 8·5 oz." (*Scully.*)

"Bill blacker than in the male; iris in very old birds brownish yellow." (*Naumann.*)

"Bill black above, slate-colour below. Iris dark muddy brown; legs and feet slaty green; webs dusky, claws black." (*Scully*, March.)

(Petchora, 24th July.) Face, throat, and neck whitish buff, with dark shaft-stripes; head and down the hind neck dark brown, the feathers edged with tawny on the head, and greyish on the hind neck; lower hind neck, scapulars, back, and upper tail-coverts brownish black, the feathers with margins and crescentic and angular bars of white: the markings of the scapulars, which are blacker than the back, consist of longitudinal streaks of white, tinged with buff; wings brown, the covert-feathers narrowly margined with greyish white, the greater coverts with sharply-defined tips of pure white; the secondaries with broad white tips, surmounted by a black edge on the outer webs of the feathers; tail blackish brown, crossed with wavy angular bars, and marked with longitudinal streaks of white tinged with buff; beneath whitish, the centres of the feathers brown and concealed in parts: flanks brown, with crescentic marks and margins of white; under tail-coverts whitish, streaked with black; axillaries white, with central streaks of dark brown.

The Hakodadi specimen is not so dark above, and the white markings are not so broad.

Young in down (Petchora river). Above very dark brown; blackish on the head, narrowing at the base of the bill into a stripe between whitish eye-stripes; lores dark brown, continued as a dark stripe behind the eye, beneath which there is another whitish streak; a broad whitish band down the sides of the back, and another crossing the wing; beneath whitish, with a dark streak along the face, and the chest tinged with fulvous; bill blackish, the nail yellowish.

Young males, according to Naumann, assume the mature winter dress in the *first year* a month later than old birds; and *young females*, according to the same authority, put on the adult plumage about the same time, and can be distinguished up to the following spring by their darker bill. A female (March) from Wisconsin, America, has the markings of the scapulars and upper tail-coverts and tail rufescent buff, which is apparently the result of immaturity.

Distribution.—This beautiful Duck visits the north of Ceylon during the months of November till March, but is said not to be so numerous as the Garganey or Common Teal. There are specimens of Layard's collecting in the Poole collection, and he states that it used to be occasionally shot on the Jaffna estuary by native duck-shooters. It occurs plentifully every season in Delft, and on the large lagoons at Palverainkadoo and Manaar, and has been met with by Mr. G. Simpson, of the Indian Telegraph Department, and Mr. G. Temple, C.C.S., in the Mullaittivu district.

Though perhaps not so widely spread as some of its allies in India, the Pintail is nevertheless very abundant in the cold season, arriving, according to Captain Butler, in the Guzerat district as early as the 12th October, and leaving again about the 10th April. It is common in Cutch, Kattiawar, and Sindh, as well as in Guzerat, being found more on lakes and jheels than rivers. It is found commonly in Cashmere on the lakes of that State, and also in Oudh and Kumaon, and is very common in the Nepal valley, according to

Dr. Scully; it is likewise plentiful in Lower Bengal, according to Blyth. Southwards in the Deccan it has been observed, but not in any numbers. In Chota Nagpur it is found on the larger rivers, and is abundant at Manbhum; in the adjacent country it is recorded from Lohardugga, Sambalpur, and Raipur. In Furreedpore it is found in large flocks; further east in Cachar it is rare, as also in Burmah, having been only met with in the Engmah swamp, while further south it is merely a straggler, having been procured but once near Moulmein. Beyond Indian limits it is very common on passage, in Mongolia, being abundant in the Hoang-ho valley and also at Lake Hanka at the end of March, passing northwards and but few remaining to breed. In China it is plentiful on passage twice a year, passing the winter in the central and southern provinces, as also in Formosa. In Japan it is common in winter in Tokio, and passes Hakodadi in spring and autumn (*Blakiston*). It is found throughout Eastern Siberia from the Amoor northwards to the Boganida, where Middendorff found it breeding; on the Amoor it is not so common as other species. Westwards, on the Yenesay, Mr. Seebohm found it one of the commonest of Ducks. In Kashgharia Dr. Scully observed it occasionally in March, and ascertained that it bred at Maralbashi. Further north Dr. Finsch found it on the Marakul lake near the Ala-taw mountains; it occurs on passage in the east and north-west of Turkestan, and possibly breeds in the south-west (*Severtzoff*). In Palestine Canon Tristram found it on the brook Kedron; and in the Sinaitic peninsula Mr. C. Wyatt met with it, as also Mr. Danford in Asia Minor, between January and April.

As regards its European distribution, my space permits me merely to say that it is found (in some places commonly) throughout the south from Greece and Turkey to Portugal in winter, occurring likewise in Malta and Sardinia; further north in Central Europe, including Austria and Southern Germany, it is mostly a bird of passage, some few only remaining to breed. It is a winter bird in France, and one of passage chiefly in Holland and Belgium; but it breeds in Denmark, as also in North Germany and Central Russia. Northwards it ranges to Archangel in Russia and to Finland; while in Scandinavia it breeds beyond the Arctic circle. On the Petchora Mr. Seebohm found it very abundant, and procured large numbers of its eggs. It is found, in winter, throughout Great Britain and Ireland, but chiefly on the east coast of the former, as far north as the Shetlands; and it is supposed by Mr. Hancock to have bred at Prestwick Car, in Northumberland. It likewise visits Iceland in the summer. Turning south again, we have it found in winter in Africa as far south as Senegal on the west coast, and the Kordofan swamps and Blue Nile on the east, wintering in numbers on the Delta of the Nile, according to Von Heuglin. In America it has a wide range on the coast, extending from North Greenland southwards as far as the isthmus of Panama, being also found in the interior of the United States and on the Saskatchewan. Messrs. Sclater and Salvin record it from Cuba and Jamaica; and in Florida it is occasionally very abundant on passage. On the west coast it has been procured in Vancouver's Island; and Mr. Dresser states that it is found in the interior of the continent of North America.

Habits.—This species, which is one of the handsomest Ducks frequenting the Palæarctic region, is mostly a freshwater bird, associating in large flocks in the cold weather on open and extensive sheets of water; but in the breeding-season it is found sometimes about the sea-coast in shallow bays. As observed in Europe it is said to be very wary and shy, even more so than the Mallard; but I find that Mr. Hume noticed that in Sindh it had a habit of sitting in parties amongst low water-plants, with nothing but its long white neck showing, and when basking thus it would often admit of a tolerably near approach. It flies with great speed, and is said to be hard to bring down; its graceful form imparts to it an elegant appearance when in the water, and it is said to swim high, with its neck curved like a Swan's. Its note is not harsh, like that of most Ducks, and is not so often uttered, the bird being of rather a silent nature. Montagu writes that its notes are "extremely soft and inward; the courting-note is always attended with a jerk of the head; the other greatly resembles that of a very young kitten. In the spring the male indicates his softer passions by suddenly raising the body upright in the water, and bringing his bill close to his breast, uttering at the same time a soft note. This gesticulation is frequently followed by a singular jerk of the hinder part of the body, which in turn is thrown up above the water." The food of the Pintail consists of vegetable and insect matter, as the roots of water-plants, grain, seeds, &c. are partaken of, as well as insects, larvæ, &c. Its flesh is considered to be excellent eating.

Nidification.—The Pintail breeds in May and June; in the latter month Mr. Seebohm took its eggs on

the Yenesay river in Siberia and on the Petchora in Russia, whilst in America it is said to commence laying about the 20th of May. The nest, writes Mr. Dresser, is made on the ground, often under the shelter of a bush, usually not far from the water, and is lined with small flags or grass-bents; and, within these, down and feathers form a soft bed for the eggs to lie upon. In number the eggs vary from seven to nine. They are smooth in texture, fairly glossy, and pointed ovals in shape, but some are of the same form at both ends. They are pale clear olivaceous greenish. Several specimens in a fine series before me, taken on the Petchora by Mr. Seebohm, measure 2·1 by 1·5, 2·05 by 1·53, 2·08 by 1·51, 2·08 by 1·49 inches respectively.

The "nest-down" is large and hair-brown in colour, not very dark, with rather wide pale centres and just perceptible pale tips *.

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* The down with which each species of Duck lines its nest, and to which I apply the term *nest-down*, is an important characteristic in determining the egg, as a thorough acquaintance with it enables the oologist to identify the eggs when the bird is not seen.

ANAS CIRCIA.

(THE GARGANEY TEAL*.)

Anas circia, Linn. Syst. Nat. i. p. 204 (1766).

Querquedula circia (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 305 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 269; Jerdon, B. of Ind. iii. p. 807 (1864); Sharpe & Dresser, B. of Eur. pt. 5 (1871); Holdsw. P. Z. S. 1872, p. 479; Salvadori, Uccelli di Borneo, p. 361 (1874); David & Oust. Ois. de la Chine, p. 502 (1877); Hume, Str. Feath. 1879, p. 115 (List of Ind. B.).

La Sarcelle d'été, Buff. pl. 946; *Marreco*, Portuguese; *The Blue-winged Teal*; *Summer Teal* in England. *Karak aurdak*, lit. "Patch-work Duck," Turki (Scully).

Adult male and female. (Ceylon) Wing 7·1 to 7·7 inches. (Denmark) Wing 7·2 to 7·5; tail 2·5 to 2·9; tarsus 1·1 to 1·2; middle toe 1·4 to 1·5, claw (straight) 0·36; bill to gape 1·8, at front to bend of nail 1·4 to 1·6.—*Female* (Amoy). Wing 6·8; bill at front 1·4.—*Female* (Sambhur Lake). Length 15·0; wing 7·4, expanse 25·5; tail 2·8; tarsus 1·15; bill at front 1·5. "Weight 12·75 oz. to 14·78 oz." (*Scully*, Yarkand).

The bill in this species has the culmen almost straight, the anterior part not being so much depressed as in the larger species of the genus.

Iris pale brown; bill black, the base beneath pale; legs and feet brown; webs darker.

Male after autumn moult (Leadenhall Market). Forehead, top of head, and nape blackish brown, bounded on each side by a broad white band commencing in front of the eye, and the forehead marked with fine whitish lines; face and neck brownish chestnut, passing on the chest and breast into light tawny, the aforementioned parts striated closely with white, and the latter closely barred with blackish, taking on the chest a crescentic form; the chin black and unmarked, and the lores darker than the face; lower hind neck, interscapulars, and back blackish brown, the feathers with pale margins; the upper tail-coverts marked with zigzag cross bars of white; the scapulars lanceolate, the uppermost feathers black, tinged with green, with parallel-edged white central stripes; the outer and broader concolorous with the wing-coverts, which are pale grey-blue; the greater series with deep white tips, forming a band across the wing; the secondaries with similar tips, the outer webs above them shining emerald-green, and the inner blackish brown; primaries brown, with white shafts and outer margins, the latter vanishing on the two first quills; tertials dark brown, with white outer margins; tail dark brown; abdomen finely vermiculated with brown, spotted with the same on the under tail-coverts, and the flank-feathers crossed with closely set, wavy pencillings of black; the lowermost feathers tipped with blue-grey, above which is a broad white bar edged with black; axillaries pure white; under wing pale brown, darkening at the anterior part, and with a white patch across the centre.

Some examples have the wing-coverts and secondaries less brightly coloured, these probably being younger birds than the above; the underparts vary in the amount of vermiculations.

This dress is worn from October until June, when a rapid moult takes place, and the male assumes a garb very similar to that of the female, except that the wing-coverts and speculum (as, in fact, the entire wing) are as before. The plumage is, however, darker above than that of the female, and the chest is more rufous. In October, or as late as December even, the clothing-feathers are moulted, and the handsome winter and spring dress again assumed. So rapid is the moult in each case that the birds are incapacitated from flying.

Female (Sambhur Lake, August). Head, lower hind neck, back, rump, and scapulars dark brown, the feathers everywhere pale-tipped; tawny grey on the head and hind neck, slaty grey on the interscapular region, rump, and

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* The Teals, which are placed under the genus *Querquedula*, Stephens, by most authors, are merely small Ducks, scarcely differing at all from restricted *Anas*, although the bills are not so wide at the tip nor so flattened at that part. The type of the group is the Garganey, which has the bill high at the base, with the culmen almost straight, and, in fact, the whole organ differing almost as much from that of the Common Teal as it does from that of the Mallard; the bill is therefore not a good distinguishing character, and I prefer not to adopt the genus in the present instance.

upper tail-coverts, and whitish with broad outer margins of the same on the tertials; tail dark brown, with whitish margins; wing-coverts faded bluish grey, the greater series with brownish slaty, with the tips for half an inch white; speculum much duller than in the male, with a black bar between the green and the white tips; primary-coverts and inner primaries bluish grey at the outer margins; tertials tinged with green; cheeks, ear-coverts, and sides and front of neck whitish with distinct dark centres, having a mottled appearance; a light stripe over the eyes, and a dark light-tipped band through the lores and behind the eye; chin and upper throat unmarked white; lower fore neck tinged with ochre-yellowish; the centres of the feathers dark, enclosing a light spot; beneath whitish, the centres of the feathers brownish; under tail-coverts patched with brown; flanks brown, pale-edged; axillaries and under wing as in the male.

"Bill black, under mandible brown; legs and feet greyish slate." (*Scully.*)

Young in down (Jutland). Glossy black above; face above the eye and the throat yellowish, with a broad stripe behind the eye, and another from the lores along the face to the ear-coverts; a faint crescentic pale streak across the back and a spot on each side of the rump; beneath whitish brown across the throat and brownish on the abdomen.

The first plumage, according to Naumann, resembles that of the female; the bill is darker, and the breast more rufescent, and the throat purer white, the male being distinguished from the female by the lighter blue-grey of the wing-coverts. The birds are then about the size of the Common Teal. Bill and feet paler than in the adult. The adult plumage is assumed in October and November.

Obs. Varieties of this species occur sometimes. Jerdon speaks of procuring birds with the whole head, neck, and underparts ferruginous; and in Europe, as also in England, pale yellowish and cream-coloured birds have been shot.

Distribution.—This fine Teal is a winter visitor to Ceylon, being found in the extreme north about the Jaffna peninsula, on the swamps of the island of Delft, and on the west coast down to Manaar during the cool season from November till March. Layard speaks of its occurring in "vast flocks" at the head of the Jaffna estuary; but I do not think it is so common now-a-days; and as early as the month of March it seems to take its departure, as I saw nothing of it in the Jaffna district at that time. Mr. H. E. Hayes, of the Ceylon P. W. Department, shot a pair at Mullaittivu in 1877; and some seasons it extends down the east coast to the Hambantota district, where Capt. Wade-Dalton recently met with it in one or two localities.

The Garganey is very abundant all over India, being found in greater numbers in Bengal than the Common Teal. It is also very common in the peninsular portion of the empire, and notably so in the Deccan. In Chota Nagpur Mr. Ball considers it to be less common than the Teal; but he records it from Manbhum, Lohardugga, Sambalpur, Orissa, Nowagarh, and Karial. It is, according to Mr. Hume, ten times more abundant in the Calcutta market than the last-named bird; and in Furreedpore it swarms in all the small jheels, remaining on the Ganges in the daytime and spreading over the country at night (*Cripps*). It is common in Rajpootana, Guzerat, Cutch, Kattiawar, and Sindh in the cold weather, but not so plentiful as the Teal in some places. In the Guzerat district it arrives, says Capt. Butler, about the 7th September, and remains until about the 14th of April; but a single bird was shot near Deesa on the 7th of July, and I have myself a specimen killed by Mr. Adam at Sambhur on the 26th of August. It is common in the Punjab, in Oudh, and Kumaon; and in Nepal, writes Dr. Scully, it is met with throughout the whole winter. It is found in Burmah and also in Tenasserim in tracts between the Salween and the Sittang, as also to the west of the latter river. It ranges southwards into the Malay archipelago, being found in Java and Borneo, as also in Celebes, where Dr. Meyer says it is rather rare, notwithstanding that it occurs there in summer, as he notes a specimen as procured in Limbotto in July. Turning north we find it recorded from Formosa by Swinhoe, who says that it probably breeds in South China. It has not been observed in North China, although it occurs in Japan. As regards Central Asia, it is common in South-east Mongolia, breeding in the marshes of the Hoang-ho valley. At Lake Hanka it appears as late as the beginning of May, and is ten times as scarce as the Common Teal (*Prjevalsky*). It is found in summer near Yarkand, and breeds in the eastern parts of Turkestan, according to Severtzoff. It ranges into Southern Siberia, and has been found on the Amoor river. Passing westward, I do not find it recorded from Palestine; but Mr. Danford informs me that he met with it in Asia Minor during the latter half of the winter.

In Southern Europe it is a common species, breeding in Greece, Turkey, Italy, and Spain at Perpignan. It likewise breeds in Sicily; is found in Malta in spring and autumn, and occasionally in summer; occurs in Sardinia in spring; appears in Savoy in March and April, a few remaining to nest; and is a summer visitant to Germany, France, and Belgium. It is plentiful at the same season in Denmark, and not uncommon in South Sweden, extending north as a straggler, but not above lat. 60° about. It has been procured near Christiania, according to Mr. Collett. It is sparingly distributed throughout England in the summer, breeding still in some localities in Norfolk; it is rare in the western parts of the country, and is very seldom seen in Wales; it is likewise rare in Scotland, and in Ireland only occurs as a straggler. Turning south, again, we find that in Northern Africa it is distributed from west to east. Favier states that it appears irregularly near Tangier in February and March on its migration to the north, returning in September. Mr. Salvin met with it in the Atlas district; and in Algeria it is common. In Egypt it is moderately abundant and resident, according to Captain Shelley; but Von Heuglin says it is chiefly a winter visitant, extending south to lat. 10° N., spreading along Abyssinian mountain-streams, and frequenting probably the entire coast of the Red Sea. It has been noticed on the west coast of Africa, but not in the south of the continent.

Habits.—This handsome bird has much the same mode of life as its ally, the equally if not better known Common Teal—principally frequenting fresh water, but sometimes in winter resorting to shallow coasts, where the tide recedes and leaves an oozy foreshore abounding in food. It is chiefly a nocturnal feeder, subsisting on grain, seeds, roots, water-plants, worms, small frogs, larvæ, &c., and feeds occasionally, it is said, on small fishes; it resorts to shallow water in marshes, particularly where the bottom is muddy, and during the day hides among reeds and rushes, or in grass at the margins of flooded marshes. Like other Ducks they wander about a good deal at night, alighting on small ponds or pools to feed, and perhaps remaining in quiet spots of this sort, if there is sufficient cover, throughout the day. They fly very swiftly, and are said, when migrating with other Ducks, not to mingle with them, but to proceed only in company with their own species. Great numbers are caught in India, and fed in "Tealeries" for the market, their flesh being excellent. In the north of Ceylon Layard writes that they used to be shot by native hunters using their plough-buffaloes trained for the purpose: guided by a couple of ropes, the shooter walking on the side away from the wild-fowl, and pulling either rope, as occasion requires, to keep himself on the offside, the buffaloes are brought within shot of the birds, and the man then rests his gun on the animal's shoulder and fires. The Garganey is not a shy bird when not molested frequently; its ordinary note is a harsh *knāk*, from which its German name *Knäk-Ente* is derived; in the breeding-season the Drake is described as uttering a loud harsh call.

Nidification.—The "Summer Teal" breeds in April and May, both in Central Asia and in Europe. It is said to have nested within Indian limits, as Col. Tickell speaks of having a just-fledged young one brought to him near Moulmein. As it is a species which breeds in comparatively warm regions, there is no reason why it should not occasionally do so in India. The nest is placed on the ground in marshes, meadows, and boggy places near water, amongst sedges and rushes; it is made of flags, rushes, reeds, &c., and is, as usual, lined with down plucked from the bird's breast. The eggs of the Garganey somewhat resemble those of the common species, but are larger and have a slightly greenish tinge. They may be described as obscure or dull white, tinged very faintly with olivaceous, but which is not perceptible in some; others are faintly tinged with brown. A fine series before me, consisting of two perfect clutches taken in Holland, are almost perfect ovals, slightly stumpy at the obtuse end, smooth in texture, and moderately glossy. Some examples of one clutch measure 1·82 by 1·27, 1·78 by 1·26, 1·79 by 1·26 inch; and three specimens of the other clutch measure 1·8 by 1·37, 1·78 by 1·32, 1·77 by 1·5. In the latter some eggs are rather stumpy at the small end.

The "nest-down" is *pale* brown, with white centres and just perceptible white tips.

ANAS CRECCA.

(THE COMMON TEAL.)

Anas crecca, Linn. Syst. Nat. i. p. 204 (1766).

Querquedula crecca (L.), Blyth, Cat. B. Mus. A. S. B. p. 305 (1849); Kelaart, Prodromus, Cat. p. 136 (1852); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 269; Jerdon, B. of Ind. iii. p. 806 (1864); Sharpe & Dresser, B. of Eur. pt. 1 (1871); Holdsw. P. Z. S. 1872, p. 479; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1322 (1873); David & Oust. Ois. de la Chine, p. 502 (1877); Hume, Str. Feath. 1879, p. 115 (List B. of Ind.).

Petite Sarcelle, Buffon, Pl. Enl. 947; *Krückente*, German; *Marreco*, Portuguese. *Tulsia bigri*, Bengal.; *Kerkedj*, Arabic.

Adult male and female. (Sambhur Lake) Length 14·0 to 14·8 inches; wing 6·9 to 7·3, expanse 21·9 to 23·5; tail 2·8 to 3·0; tarsus 1·1 to 1·15; middle toe (without claw) 1·4, claw (straight) 0·3; bill to gape 1·6 to 1·7. (Kashghar) "Length 14·0 to 14·3; wing 7·0 to 7·25; tarsus 1·17 to 1·2" (*Scully*).—*Males* (Europe). Wing 6·9 to 7·3; tarsus 1·1 to 1·15; bill at front to bend of nail 1·4 to 1·5. Bill stouter in the male than in the female; the latter smaller also in all its dimensions.

Male. Iris brown; bill black; legs and feet brown; claws black.

Male after autumn moult (Sambhur, December). Head, throat, and upper part of fore neck rufous-chestnut, the feathers tipped pale; an elongated glossy green patch from just in front of the eye to the nape; chin and bordering the gape brown, succeeded by a buff border, which passes in a streak above the eye and down beneath the green patch in the form of a white line; just beneath the eyelid a whitish spot; fore neck, hind neck below the rufous, interscapular region, sides of breast, and rump black-brown, finely vermiculated with white; rump ashy brown, mottled with whitish; upper tail-coverts black, paling off into buff at the edges; tail grey-brown, with pale edges; wing-coverts brownish ashy, the greater series broadly tipped with white, changing into rufous on the inner feathers; primaries and inner webs of secondaries plain brown; outer webs of the foremost secondaries velvety black, tipped with white, those of the innermost shining emerald-green illumined with blue; lowermost tertial feathers whitish next the shaft, with a broad black border; beneath white, the feathers of the chest and upper breast with round blackish spots; the abdomen marked with cross rays of paler brown than the flanks; under tail-coverts black, broadly edged with white, the lateral feathers buff; axillaries and centre of under wing pure white; edge of under wing brown.

This dress is assumed in October and worn until the following June, about the end of which a plumage similar to that of the female described below is put on, except that the upper surface is more uniform, wanting the crescentic edgings in a great measure. The larger size of the bill likewise serves to distinguish the male in this dress.

Adult female. Bill not so black as in the male; legs tinged with reddish.

Above dark brown, paler on the hind neck; feathers of the head margined with rufescent grey; lower hind neck and back with pale crescentic bars, which are whitish, except on the upper back and scapulars, where they are rufescent; upper tail-coverts edged with buff-grey; tail darker brown than in male; wing-coverts slightly darker than in the male, innermost part of the white wing-bar not quite so much tinged with rufous; speculum the same, but smaller; tertials narrowly edged with white, with an internal dark border; lores, face, and sides and front of neck whitish, the feathers centred with brown; throat unspotted white, or white with small brown specks; beneath white; lower part of fore neck tinged with fulvous at the margins of the feathers, next to which is a dark ring enclosing a white centre, which is concealed; flanks brown, with white edges and inner lanceolate bands of rufous-buff; axillaries and under wing as in the male.

Young, nestling. Not to be distinguished from that of the Garganey, previously described.

Immature in first autumn. Characterized by its rufescent markings above and by the stronger rufous tint of the chest: the rufous edgings and bands of the scapulars brighter than those of the back; the white wing-bar more

tinged with rufous than in the adult; tertials barred with rufous-buff on the outer webs. Bill blackish grey, fleshy beneath at the base and at the gape.

Obs. I detect no difference in Asiatic and European examples of this species. An interesting Asiatic ally of this Common Teal is the beautiful Lake-Baikal Teal, *A. formosa*, Georgi. It is a larger bird, measuring in the wing, ♂ 8·5 inches, ♀ 8·1. The coloration of the head in the male is striking: the crown and throat are black, and the face buff, with a black white-edged band from the eye to the throat; the back is blue-grey, finely marked. It is the Clucking Teal of Jerdon's work, and has been obtained near Calcutta and in Sindh.

Distribution.—The Teal is said to be tolerably plentiful in some years in the Jaffna peninsula, where it chiefly frequents the head of the lagoon near Ethelemaduvil. In the island of Delft and at the Palveraínkadoo lagoon, on the north-west coast, it appears yearly, writes Mr. G. Simpson, in thousands in November, leaving at the end of February. Layard speaks of vast flocks visiting the Jaffna estuary in the months in question, and being shot and sold by the natives in his time for as low a price as ½*d.* each. I have made inquiries of several gentlemen who have been from time to time resident in the peninsula, among whom I may mention Mr. W. Murray, of the Ceylon Civil Service, a keen sportsman, and one who has often shot Teal, and I cannot learn that the species is so abundant now-a-days in that locality as it was prior to the date of Layard's catalogue. It extends into the interior, visiting the tanks at Anaradhapura, Madewatchiya, Kanthelai, and other places, among which I have seen it at the small tank at Pankulam. It is found as far south as the Uswewa district, and on the east coast affects the Topoor tank, extending in small numbers down to the Yāla district.

This duck is abundant in parts of India from October until April, but does not occur in such great numbers as the last species, particularly in the Calcutta district. Eastward it is common in Upper Burmah (*Oates*), but is rare in Tenasserim, only having been observed in the plains between the Sittang and the Salween. In the peninsula of India it is common in the Deccan, but does not occur in very great abundance in Chota Nagpur (*Ball*); and in Furreedpore it has not been noticed by Mr. Cripps. In the Nepal valley it is very common; but in North-western India it is perhaps more abundant than elsewhere, being recorded as common at the Sambhur Lake, in Sindh, Cutch, Guzerat, and Kattiawar. It occurs in the Punjab, and in Cashmere and Kashgharia it is very abundant from November until February, but does not stay to breed. It is found on passage in Turkestan, breeding, according to Severtzoff, up to an elevation of 6000 feet; and in the south-western portion of the country it remains throughout the winter. In Mongolia it is extremely abundant, writes Prjevalsky, on migration; large flocks were seen at Dalai-nor, and at Koko-nor it was abundant in March, in which month also it appears at Lake Hanka, a few remaining to breed. It is very common in Amoor Land, and abundant at the source of the river and in South-west Siberia. On the Yenesay it appears as soon as the ice breaks up; and Mr. Seebohm found it breeding as high as 70½° N. lat. On the Ob, Dr. Finsch met with it as far north as Obdorsk. Eastward it extends to Kamtchatka. In Japan it is plentiful, remaining in winter in Yesso, the most northerly island. Throughout China and Formosa it is abundant in winter, according to Swinhoe. It does not extend to the Philippines or any further to the south than Formosa. Returning to Western Asia, we find it occurring in Persia; in Palestine Canon Tristram found it common in winter, and in the peninsula of Sinai Mr. C. Wyatt met with it. In Asia Minor it is not uncommon, writes Mr. Danford, in the mountain-rivers. It is common in Turkey, and a resident on the Black Sea (*Nordmann*). It breeds in Greece, and is abundant in the Ionian Isles in winter (*Lilford*). Throughout the southern and central portions of Europe it is more or less plentiful, but does not remain in the summer in all parts, as, for example, in some parts of Italy, where Salvadori is uncertain as to its breeding. It is abundant in Northern Europe in the summer, breeding as far north as Lapland and the White Sea. It is distributed all over Great Britain, breeding even in the southern counties, and occurring in the Orkneys and Shetland. In Iceland it is abundant, arriving there, according to Faber, in April and staying until October. It has been occasionally found in Greenland, and occurs on the eastern coasts of America as a straggler. It has been noticed in the Azores and in Madeira, and in North Africa it is not uncommon from west to east. In Egypt it is in fact very abundant according to Capt. Shelley and Von Heuglin, and is resident there, occurring as far south as the Blue and White Nile and the Somauli coast.

Habits.—The Teal, which, owing to the handsome plumage of the male, may be considered one of the

most interesting species of Ducks found within Indian limits, associates in large flocks in the cold season, and affords excellent shooting in jheels and tanks, where reeds and overgrowth afford it cover. Like all Ducks, it possesses great powers of flight, which, however, in the present instance are increased, owing to the powerful wing which the Teal possesses in proportion to its small body; and its great speed on the wing makes it all the more attractive to a keen sportsman. Like the Wigeon and the Mallard, it is almost entirely a night feeder, reposing during the daytime in the sheltered nooks of tanks and lakes, or among reeds in rivers, and sallying out at sunset to some great common feeding-ground. In some countries it resorts greatly to shallow sheltered waters on the coast during the day, and flies in to land at sunset to feed, returning in the morning to the salt water; and during its passage to and from its feeding-grounds it affords excellent flight-shooting. Teal fly in flocks of a dozen to twenty or more, and large flocks are made up of several of these troops or "bunches" as they are called by fowlers in England, which sometimes rise and fall in their rapid progress. It is not a very wary bird; and when put out of reeds or other cover often realights again a little distance off. Its ordinary call-note is a monosyllabic sound like *knāk*; and in the breeding-season it utters another, which Naumann likens to the syllable *krlück*. The diet of the Teal consists of vegetable matter (weeds, roots, seeds of water-plants) and also of insects, larva, worms, and so forth.

Nidification.—This species breeds in May and June, resorting to extensive marshes, heaths near water, and large peat-bogs. The nest is made on the ground among grass or rushes or in thick heather, in which latter case it is placed sometimes in the middle of a clump, and so entirely concealed from view that the bird cannot be seen on its nest. The nest is made of dead flags, rushes, grass, reeds, &c., with a capacious interior, which is amply lined with down plucked from the bird's breast. The number of eggs varies from eight to fourteen, and occasionally as many as twenty have been found in a nest; they are small for the size of the bird, oval, but slightly more obtuse at one end than the other, of a uniform creamy-white or pale buff. There is a greenish variety sometimes found, very like the Pintail's eggs. A series before me from the Petchora, taken by Mr. Seebohm, vary in length from 1·58 to 1·7 inch, and in breadth from 1·16 to 1·27. The old birds are said to manifest great affection for their young. Macgillivray relates an instance of his finding a brood of young with their mother on a road; and when he took them up to put them to a pond close by, whither he thought the old bird was leading them, she followed him, fluttering round him within reach of his whip.

The "nest-down" is dark brown, with pale whitish centres, but no pale tippings.

Genus SPATULA.

Bill longer than in *Anas*, compressed at the gape, and widening out from there to the tip, which is boldly rounded; lamellæ very fine, highly developed, extending from the gape round to the nail, and projecting below the edge of the mandible. Wings pointed, 1st and 2nd quills the longest. Tail pointed, of 14 feathers. Tarsus short; feet as in *Anas*.

SPATULA CLYPEATA.

(THE COMMON SHOVELLER.)

Anas clypeata, Linn. Syst. Nat. i. p. 200 (1766); Naum. Naturgesch. der Vög. Deutschl. xi. p. 747 (1842).

Spatula clypeata (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 303 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 270; Jerdon, B. of Ind. iii. p. 796 (1864); Holdsw. P. Z. S. 1872, p. 479; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1331 (1873); Dresser, B. Eur. pt. 21 (1873); Scully, Str. Feath. 1876, p. 199; Sclater & Salvin, P. Z. S. 1876, p. 396; David & Oust. Ois. de la Chine, p. 500 (1877); Hume, Str. Feath. 1879, p. 115 (List B. of Ind.).

Le canard Souchet, Buff. Pl. Enl. 971, 972; *Red-breasted Shoveller*, Lath.; *Blue-winged Shoveller* of some; *Spoon-billed Duck* in India; *De Slobeend*, Dutch; *Pato trombeteiro*, Portuguese. *Kana kaurdak*, Turki (Scully); *Kisch*, Arabic; *Tidari*, Hind.

Adult male. (Europe) Wing 9·1 to 9·5 inches; tail 3·6 to 4·0; tarsus 1·3 to 1·4; middle toe 1·7 to 1·9, claw (straight) 0·4; hind toe 0·4; bill to gape (straight) 3·0 to 3·1, width at tip 1·2, at base 0·55. (Yarkand) "Length 19·8; wing 9·3; tail 3·3; tarsus 1·4; bill from gape 2·85." (*Scully.*)

Iris reddish orange; bill greyish black; legs and feet reddish orange, claws brownish.

Male after autumn moult. Head and neck black, glossed with blue-green, which reaches almost round the base of the bill and down the throat; this dark colour ends abruptly round the bottom of the neck, below which the lower neck and upper part of chest are white, as are also the upper scapular feathers, the innermost under wing-coverts, and axillaries; centre of the hind neck and interscapulary region brownish black, darkening into deep black on the rump and upper tail-coverts, which have a greenish lustre; the feathers of the lower hind neck edged with greyish; scapulars lengthened and lanceolate; the inner longer feathers black, with central white stripes, the outer delicate azure-blue with white central stripes; the tertials (lanceolate) black, glossed with green, and with a handsome central stripe at the tip blending into the dark hue; some of the shorter scapulars mottled with blackish; lesser wing-coverts pale glossy grey-blue; the greater brown, the visible part of the tips white, forming a bar across the wing; secondaries brown, tipped with white, terminal portion of the outer webs brilliant green; primaries brown, with white shafts; tail brown, the central feathers edged with white, and each succeeding feather more deeply marked in the same way, the two lateral pairs being almost white; beneath, from the chest, dark rufous, the centre of the belly darker than the surrounding plumage; under tail-coverts black; the shorter feathers at the vent whitish, stippled with rufous; under wing along the edge brown.

This plumage is worn through the winter and spring until the following June, when the male assumes a plumage very similar to the female below described, but recognizable from that of the other sex by the blue wing-coverts, *broad* white tips of the greater coverts, and dark green speculum. This livery is worn until the following October, when the above-described handsome plumage is again donned.

Female. (England: coll. Dresser) Wing 8·7 inches; tail 3·8; tarsus 1·4; middle toe 1·7; bill to gape 2·6, at front 2·2. (Yarkand) "Length 17·5; wing 8·35; tail 3·1; tarsus 1·25; bill from gape 2·65." (*Scully.*)

Iris brown; bill brown, lower mandible yellowish; legs and feet impure orange-yellow, claws brownish.

Head, neck, and under surface glossy clay-buff, unmarked on the chin and upper part of the throat, but the feathers on the head, face, and neck with brown central stripes, very broad on the crown and hind neck; a small space at the front of the lores unspotted; the feathers of the fore neck, chest, and under surface with the central parts brown, here and there concealed on the lower parts beneath the yellow margins, but bold and exposed on the flanks, and very dark on the lower fore neck; interscapulary region and scapulars brown, boldly edged with light buff, and some of the scapulars with longitudinal curved stripes of the same; the rump almost uniform dark brown; the shorter upper-tail-coverts with crescentic bands of white, and the longer with bar-like spots of rich buff; tail buff, the feathers with lanceolate marks of dark brown near the tips, which pale gradually towards the outer feathers; lower wing-coverts light brown, pervaded with bluish, the greater series broadly tipped with white; the secondaries more narrowly so, brown externally, and washed with green on the outer webs;

tertials terminally margined with white; axillaries and under wing white, the edge of the latter marked with brown.

Young in down (Perm). Head, centre of hind neck, and upper surface glossy dark brown; a dark brown stripe through the lores and behind the eye, joining the brown of the nape; ear-coverts brownish; a whitish spot behind the wing and another behind the legs; face, supercilium, and fore neck dusky buff, the tips of the down being dark, and imparting a dusky appearance; under surface whitish, shading into brown on the flanks; bill black; nail yellowish; legs and feet brown.

Both sexes in first plumage resemble the adult female, according to Naumann, the male having the wing-coverts and speculum brighter than the female. The *young* male assumes its full plumage a few weeks later than the adult, and may be recognized, during its first year, by its paler bill, which is bluish black. The lustre of the head and neck is not so pure, and the upper back not so dark. Iris yellow; legs paler than in the adult. *Immature females* are darker than adults.

Obs. Whether the South-African Shoveller be the same or not as the present species has remained a matter of doubt, owing to the great paucity of specimens to hand from that region. The type is a young bird, and the only specimen in the British Museum is immature. Von Heuglin writes concerning a single specimen that there are

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Subfam. FULIGULINÆ.

Head larger and wings shorter than in the last subfamily. Legs short, set further back; the feet large, and the *hind toe lobed* or partially webbed.

With a single moult. Speculum inconspicuous or wanting.

Genus FULIGULA.

Bill rather broad and flattened near the tip, base of the culmen wide; nail short; nostrils advanced; lamellæ broad and shallow. Wings pointed, 1st quill the longest. Tail short and cuneate, of 16 feathers. Tarsus much shorter than the middle toe. Feet very large; webs extending to tip of toes, as likewise the lobe of the hind toe.

FULIGULA RUFINA.

(THE RED-CRESTED POCHARD.)

Anas rufina, Pall. It. ii. App. p. 713. no. 28 (1773).
Branta rufina (Pall.), Blyth, Cat. B. Mus. A. S. B. p. 306 (1849); Jerdon, B. of Ind. iii. p. 811 (1864); Holdsw. P. Z. S. 1872, p. 480.
Fuligula rufina (Pall.), Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 269; Dresser, B. of Eur. pt. 22 (1873); Hume, Str. Feath. 1879, p. 115 (List B. of Ind.).
Canard siffleur huppé, Buff. Pl. Enl. 928; *Red-crested Duck*, Lath. *Kizil bash aurdak*, lit. "Red-headed Duck," Turki (Scully).

Adult male. (Europe) Wing 10·2 to 10·6 inches; tail 3·3 to 3·5; tarsus 1·5 to 1·6; middle toe 2·5, claw 0·4; hind toe (with claw) 0·7. (Yarkand) "Length 21·0; tail 4·0; tarsus 1·6; bill from gape 2·4: weight 2 lbs." (*Scully*.)
Iris red or reddish brown; bill fine vermilion; legs and feet red, webs dusky, claws brownish.

Male, after autumn moult (Sicily). Head, nape, face, throat, and sides of neck for half its length fine pale glossy chestnut, darkest on the throat and anterior part of the face, and palest on the head, where the feathers from the forehead to the occiput stand erect in the form of a helmet-shaped crest, the nuchal feathers being likewise elongated, but not erect; centre of the nape, back, and lower part of the neck velvety black, this colour running up as

some trifling differences in the bill, that the nostrils are larger, and the middle toe longer. I think it therefore extremely probable that the Cape Shoveller is the same as the common and widely-distributed form.

Other species are:—the Australian Shoveller (*S. rhynchotis*, Lath.). In this the under surface in the male is chestnut, with crescentic bands of black; the face is green, with a white band from the lores to the throat; wing-coverts slate-blue, with a broad wing-bar. The absence of the white chest is the most characteristic difference.

S. variegata, Gould, is peculiar to New Zealand, being there the representative of *S. rhynchotis*; it has the white facial band, the chest, breast, and scapulars whitish, with crescentic margins of black to the feathers.

S. platalea, Vieill., the South-American Shoveller, is ruddy above and beneath, with white spots on the head; lesser wing-coverts blue, median white. "Wing 8·0, bill to gape 2·7" (*Sclater*).

Distribution.—This remarkable and almost cosmopolitan Duck is a not unfrequent winter visitor to Ceylon. I have not met with it myself, but Mr. G. Simpson informs me that it comes in large numbers to Delft and the Palverainkadoo and Mullaittivu lagoons, remaining during the same period as the Teal and Pintail. Layard not only discovered it one year near Jaffna, but found it breeding there at the Chavagacherry lagoon in March. He there met with a female with twelve young ones, most of which he captured, and in the month of November he obtained specimens from native shooters. Its breeding in these latitudes must be considered a most abnormal circumstance.

In India it is a very common bird in some parts, being in Guzerat, writes Capt. Butler, one of the most abundant Ducks. Mr. Hume met with it on large lakes in Sindh, and on the rivers Jhelum, Chenab, and Indus. It is common in Kutch, Kattiawar, and Jodhpoor, and at the Sambhur Lake is very plentiful. It is a winter visitor to the valley of Nepal, writes Dr. Scully, and is common there in migration to and from the Plains. In Lower Bengal it is pretty common; but in the Chota-Nagpur division it is rare, being recorded by Mr. Ball only from the Rajmehal hills, Manbhum, Orissa, and Jaipur. In the Deccan it is not uncommon in

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a stripe between the chestnut, and toning down on the lower part of the hind neck and throat into deep glossy brown, which pales on the interscapulary region and scapulars into chestnut-brown; lower back, rump, and upper tail-coverts black-brown; wing-coverts light earthy brown, with the margin of the wing, as also a patch at the origin of the scapulars, white; secondaries white, tipped with dark brown; primaries white, with the terminal portions and the outer webs of the first three dark brown, continued as an edging on the next two; tail dark brown, the lateral feathers whitish near the tips; beneath, the dark brown of the chest pales somewhat on the under surface, where the feathers are pale-edged, and intensifies again on the vent and under tail-coverts, which are blackish brown; middle of flanks and the sides of the central parts of the breast white, the feathers tipped with brownish; axillaries and under wing white.

This plumage is worn till the following June or beginning of July, and the male then assumes a livery resembling that of the female; but said to be distinguished from the latter by the brighter-coloured bill and iris, the darker and more rusty hue of the head and the throat, and the more bushy crest, the dark brown of the upper and under tail-coverts and belly, the clear grey wing-coverts, the greyer and whiter-tipped tail-feathers, and the redder feet.

Adult female (Sicily). Wing 9·3 inches; tail 3·2; tarsus 1·5; middle toe 2·4; bill to gape (straight) 2·05.

Iris yellow; bill brownish red above, fleshy beneath, nail brown; legs and feet murky yellow.

Head and occiput russet-brown, the feathers thick and bushy, but not erect; hind neck, interscapular region, scapulars, and wing-coverts pale olive-brown, darkening on the lower back and upper tail-coverts, the latter of which are yellowish brown at the tips and sides; secondaries sullied white, brownish near the tips, which are pure white; primaries buff-white, dark brown at the tips, and the outer webs of the 1st four quills brown; winglet and primary-coverts browner; tail light brown, tipped pale; throat white; under surface brown, the feathers deeply tipped with greyish white, blending into the darker colour, which is most prominent on the chest; axillaries pure white; under wing whitish, tinged with brown beneath the anterior edge.

Young in down. Has a "double olive-grey stripe from the lores, dividing before the eye, and bordering the yellowish-grey eyebrow above and the cheeks and auriculars below; upper parts, crown from the base of the bill, nape,

winter; but further south I imagine it is only of accidental occurrence. I find no record of its having been observed on the eastern side of the Bay of Bengal; but on its migration to the Mongolian regions it no doubt passes up the valley of the Brahmapootra, and thence from the confines of Assam to Koko-nor and the Hoang-ho valley, where Prjevalsky found it not uncommon in March. Some few remain to breed at Lake Hanka, but the majority move on. In China it is common in winter, as also in Formosa. To the north it is found throughout Amoor Land, extending to Japan and Kamtchatka. Moving westward now, we find it inhabiting the plains of Kashghar in November and December, but not remaining throughout the winter; in Turkestan we have Severtzoff's authority for its breeding, and being found on passage, in the east and north-west of that country; and further north it has been met with in Western Siberia, and occurs, though not commonly, on the Yenesay as far as the Arctic circle, where Mr. Seebohm procured it. In various parts of Palestine it was obtained by Canon Tristram, and thence westwards it is found in Asia Minor and also in Southern Europe, including Greece and the Mediterranean islands, as a bird of passage from Northern Africa (where it is very abundant in winter) to the northern parts of the first-named continent. Here it occurs in Scandinavia up to the Arctic circle, and in Russia as far as the White Sea, being very abundant in the Delta of the Dwina in the breeding-season, though not so much so on the Petchora further east. It likewise breeds in Central Europe, but in Hungary it is only seen on migration. It is a summer visitant to England and Scotland, breeding in Norfolk, Durham, and Northumberland, as also in Scotland as far north as Elgin. Turning to the south, again, it is not uncommon in Spain and Portugal, and is met with in considerable numbers near the Straits from October until April. In Morocco and in Algeria it is common, breeding in the latter country; and in Egypt it is very abundant, wandering south to the White and Blue Nile, and has been met with the whole year round by Von Heuglin in Abyssinia, at an elevation of from 6000 to 8000 feet. Should the South-African species prove to be the same, the range of this Shoveller will extend to the neighbourhood of Cape

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back, and wings dull olive-grey, excepting the spot on the shoulder, which, with the rest of the body, is pale yellowish grey; iris dark brown; bill reddish brown, with the nail white; feet ash-grey, with a greenish tinge, webs and toes narrowly edged with yellowish white." (*Dresser*, fide *Baldamus*.)

Young male. "Resembles the female, but has the crest much fuller and more rufous in colour, in tinge much closer to that of the male, only duller." (*Dresser*.)

Young female (Yarkand). Wing 8·9 inches. "Bill dusky above, brownish below; legs and feet dusky, yellowish green in parts." (*Scully*.)

Distribution.—A Duck, identified with the Red-crested Pochard, was met with by Layard in the Jaffna peninsula, concerning which he writes as follows:—"I introduce this species with a mark of doubt, because I only know them through my telescope. I saw two or three pairs for several weeks on a piece of brackish water between Jaffna and Chavagacherry; they would not allow me to get within 250 or 300 yards of them, and I therefore never managed to shoot one. A head of *F. rufina*, however, which I received from Calcutta, was identified by a native as of a bird he knew and had killed on that very piece of water, though he had not seen them elsewhere." Subsequently he writes me that he is sure he identified the bird correctly; but, in accordance with the practice adopted throughout the work, I doubtfully introduce the species into it. According to Jerdon it is found throughout the greater part of India, but is more rare in the south. I find it recorded recently from the Deccan (*Fairbank*), from several parts of Chota Nagpur, in the Manbhum district of which province it is not rare (*Ball*), as being very common near Calcutta, as a straggler from Furreedpore; and, on the north-western side of the peninsula, as found in Cutch, Kattiawar, Sindh, Guzerat, and Jodhpoor. It occurs on large tanks in Guzerat, and on lakes in Sindh; and is common at Sambhur in the cold weather (*Adam*). It likewise is found in the Punjab, Cashmere, and Oudh. It breeds throughout Turkestan, and is resident in the south-west of that country; at Yarkand it is a summer visitor (*Scully*). It does not appear to extend into Central Asia, but ranges westward through Palestine to South-eastern Europe, where it is found in Greece, Turkey, Southern Russia, and also in Hungary, extending thence into Bohemia and Southern Germany. It is found in Italy, Malta, Sardinia, and Sicily, breeding in the two latter islands. In Spain it is mostly confined to the east coast, being common at Valencia, and very

Town, but where, according to Layard, it is rarely seen. North of Damara Land it will probably be found to occur at various points of the coast. At present we know that it has been noticed as far south as Senegambia. Finally, before quitting the Old World, it is interesting to remark that it has occurred as a straggler in Australia (having wandered thither most likely from China), as Gould records its occurrence in New South Wales in his 'Handbook of Australian Birds.' In another direction it has been found, according to Hartlaub, in the Sandwich Islands. In America it has occurred on the west coast as far north as Alaska, and in the east inhabits parts of the United States in the breeding-season, and is found in Texas and Florida, and likewise in Mexico and Guatemala, in which latter region Mr. Salvin procured it and found it common in winter. In

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rare in Andalucia. It is a straggler to France, Belgium, and Northern Germany, as also to Great Britain, where it has chiefly occurred along the south coast and in the eastern counties. It has been obtained in Scotland, which is about its most northern limit, and it is doubtfully recorded from Sweden (Gothenburg). It is said to have bred in Denmark. Lastly, in Northern Africa it has been met with in Morocco, in Algeria, and in Egypt, in the second of which countries it appears to be common, and where Mr. Salvin found it breeding at Zana.

Habits.—This handsome Pochard, though belonging to the family of diving Ducks, which are mainly characterized by their webbed or lobed hind toes, is said by those who have observed its habits not to dive for its food, but to feed, like ordinary Ducks, in shallow water, with its neck stretched down and body turned up. When occasion offers, however, it can dive excellently; and Dr. Scully, who observed it in Kashgharia, speaks of a habit which is peculiar to diving-birds that swim with speed beneath the surface, remarking that it emerges from the water with a sharp spring, and further that it "carries its head well bent back over its shoulders, and is not easily approached." It frequents fresh water in preference to salt, and does not associate in large flocks. In India it is found in large tanks and jheels, and is very difficult to shoot, getting up, writes Captain Butler, at the least sign of danger, and flying up and down invariably out of gun-shot. Naumann describes its call-note as being very harsh, like the croak of a Crow, and says that it is only uttered when the bird is put up. The food of this species consists of vegetable matter—water-plants, grain, &c., and its flesh is consequently excellent; it, however, feeds on frogs' spawn and small shell-fish as well.

Nidification.—This species breeds in May and June; several localities have been mentioned in my account of distribution, the nearest to India being the vicinity of Kashgharia and Turkestan. The nest is placed among rushes and flags, and is made of reeds, grass, rushes, and leaves, resembling, according to Canon Tristram, that of a Coot, being, however, lined in the usual manner with down and feathers. The eggs vary from seven to nine, and before being blown are "fresh green;" but this tint fades after the preparation of the specimen, and they become greenish grey. Three eggs average in size $2\frac{11}{40}$ (0·27) by $1\frac{24}{40}$ (0·6) inch (*Dresser*).

Note.—Fuligula ferina. Another Duck of this group likely to occur in Ceylon is the Common or Red-headed Pochard (*Anas ferina*, Linn. S. N. i. p. 203). It is found in the cold weather in many parts of India, being common in the north-west portions of the empire and in portions of Bengal; it may therefore occasionally migrate as far south as Ceylon. I have been informed that Mr. Varian, of the Public Works Department, has shot a Duck on Topoor tank, which he styled the "Canvas-back," and which may have been this species. A male in my possession measured in the flesh—length 18·5 inches; wing 8·0, expanse 31·0; tail 3·0; tarsus 1·5; middle toe 2·6; bill to gape (straight) 2·2. Iris golden yellow; bill blackish leaden; legs and feet dark plumbeous. Entire head and upper neck rufous chestnut-brown; neck before and behind and upper chest black; upper back, scapulars, and under surface white, finely vermiculated or cross-rayed with dark grey, less on the breast than elsewhere; upper and under tail-coverts black; wings slaty grey, mottled on the coverts and near the tips of the secondaries with white; tail dark grey. It is found throughout Europe and Northern Africa, as also the warmer parts of Asia, breeding in the north of the latter continent, but not extending eastwards in Siberia of Lake Baikal, although, from native drawings of it, it appears to have occurred in Japan. It is distributed throughout China in the winter. In India it is found, according to Jerdon, in small parties in tanks and jheels, and, as its flesh is excellent eating, it is much sought after. It is not particularly shy, and has been noticed to swim out of the way of danger rather than to take wing. It is very like the Canvas-back Duck of America, differing from that species in its smaller size.

the West Indies it is, according to Gundlach, a regular winter visitant to Cuba, and in Jamaica it is said to be numerous.

Habits.—This remarkable Duck, which is peculiar in being the only widely-distributed species of the little group to which it belongs, is almost entirely a frequenter of fresh water, affecting the margins of ponds, lakes, marshy rivers, and jheels, where it feeds in shallow places among weeds and vegetable matter. It searches for its food chiefly in mud, and subsists to a great extent on worms and aquatic insects, which its peculiar comb-like lamellæ enable it to sift out of the earthy matter in which they are found. Its flesh is said by most writers to be very inferior eating; but, notwithstanding, it is frequently shot, as it is not at all shy, and its handsome plumage presents a bait to the sportsman. The Shoveller, although it collects in great numbers in one locality when suitable feeding-grounds attract it, usually goes in small parties, which keep a little apart from one another, and often mix with a few individuals of other species; Jerdon, for instance, notices that it is often to be seen with the Gadwall, which is very abundant in India.

Nidification.—The Shoveller breeds in May and June, the regions nearest India to which it resorts to for this purpose being Turkestan and Mongolia, in which latter Prjevalsky found it nesting in the Hoang-ho valley. In Europe it lays in the most secluded parts of marshes and swamps, making a nest of flags, rushes, reeds, sedges, &c. on a dry spot, and lining it with feathers and down. The eggs vary in number from eight to twelve; they are very pale stone- or grey-green, rather long ovals slightly compressed at one end, smooth in texture, with a slight gloss. The dimensions of three examples in a small series from the Petchora are 2·18 by 1·48, 2·19 by 1·54, 2·14 by 1·4 inches respectively.

The "nest-down" is small, dark brown, with small plainly-defined whitish centres, without pale tips.

Note.—I have sportsman's authority for the occurrence of the Mallard (*A. boschas*, Linn.) in the Jaffna district; but I am inclined to think that the Indian Wild Duck has been mistaken for it.

ANSERES.

Fam. PHŒNICOPTERIDÆ *.

Bill very large, high at the base, suddenly bent down about the centre, with a corresponding angle in the commissure. Legs very long.

Not of natatorial habit. Sternum with a single deep notch in each half of the posterior edge. Loral space bare.

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* The Flamingoes are placed by some systematists among the *Herodiones* (Herons, Ibises, &c.), with which isolated group they have nothing in common, except length of leg and a partial resemblance in their mode of feeding. They constitute a specialized and somewhat aberrant Anserine form; their young, which are autophagous, their eggs, and their nidification (though somewhat peculiar) are those of this order: in the lamellæ of the bill and the fleshy tongue they possess *the* great characteristics of the Anseres; the sternum is Anserine, and, finally, the body is set horizontally on the legs like that of a Goose, and not held upright as in the Herons.

Genus PHŒNICOPTERUS.

Bill deep at the base, straight and somewhat cylindrical for half its length, with the culmen slightly keeled, then suddenly bent down and horizontally compressed; the culmen flattened; commissure ascending from the gape to the point of depression of the culmen, then angulated and running parallel to the latter; nostrils linear, advanced, placed near the commissure; margins of both mandibles furnished with fine lamellæ. Wings pointed, the 1st quill the longest. Tail short. Legs very long; the tarsus scutellate in front. Feet webbed, the exterior edge emarginate; hind toe small.

PHŒNICOPTERUS ROSEUS.

(THE COMMON FLAMINGO.)

Phœnicopterus roseus, Pall. Zoogr. Rosso-As. ii. p. 207 (1811); Blyth, Cat. B. Mus. A. S. B. p. 299 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 268; Jerdon, B. of Ind. iii. p. 775 (1864); Dresser, B. of Eur. pt. 75, 76 (1879)

Phœnicopterus ruber, Sykes, P. Z. S. 1832, p. 159.

Phœnicopterus antiquorum, Temm. Man. d'Orn. ii. p. 587 (1820); Holdsw. P. Z. S. 1872, p. 479; Heuglin, Orn. N.Ost-Afr. ii. p. 1263 (1873); Hume, Str. Feath. 1879, p. 114 (List Ind. B.).

Flammant, Buffon, Pl. Enl. 63. *Nihaf*, Arabic; *Bag hans*, lit. "Heron Goose," also *Raj hans*, Hind.; *Krop-gans*, Dutch in Ceylon; *Kan-thunti*, Bengal.; *Pu-konga*, Telugu; *Pu-nari*, Tamil; *Inglis Koku*, lit. "English Heron," from a fancied resemblance to soldiers ; *Urian*, Jaffna Tamils.

Adult male? (Ceylon, Poole collection). Wing 16·0 inches; bill along culmen 5·8.—*Adults* (Brit. Mus.). Wing 16·5 to 17·5; tail 6·0; bare tibia 9·0; tarsus 13·2; middle toe with claw 3·7; bill along culmen 5·7, depth at centre 1·5.—*Male* (Sambhur Lake). Length 50·0; wing 17·5; tail 6·0; tarsus 14·9; bill along culmen 6·4. *Female.* Length 40·2; wing 15·0; tail 5·1; tarsus 10·4; bill along curve 5·6 (*Adams*).—*Male* (South Africa). Wing 16·08; tail 6·25; bare tibia 7·66; tarsus 11·5; bill at front 5·08. *Female* (Tripoli). Wing 14·03; tail 5·25; bare tibia 7·75; tarsus 10·5; bill at front 4·75 (*Von Heuglin*). The female of this species is smaller than the male.

Iris pale yellow; bill rosy red, terminal half black; loral skin whitish pink; legs and feet pinkish red, claws black.

Living example (Zoological Gardens). Plumage white, tinged with rosy, particularly on the neck, the region round the eye being brighter than elsewhere; the interscapulars tinged with cerise, the tertials pale scarlet at the tips; the bastard wing and primary-coverts light scarlet, passing into rosy white on the inner webs; primaries and secondaries black; scapulars lanceolate in shape and with dark shafts; under wing at the edge scarlet; axillaries bright scarlet; median under secondary- and under primary-coverts black.

Young in down. "Covered with close down, in texture like that on a young Swan; entire plumage white, the upper parts slightly tinged with dusty grey." (*Dresser.*)

Nestling just fledged. Wing 13·5 inches; tarsus 6·5.

Head, neck, and under surface white, faintly tinged with rosy; back and wing-coverts reddish sandy, with dark shaft-stripes; the greater wing-coverts terminally brown, with pale margins; primary-coverts sandy, with sharply defined black tips; quills black.

In *a bird of the year* (B. Mus.) the plumage is white, the scapulars with dark shafts, and patched near the tips with dark brown; the wing-coverts with brown-edged pale centres increasing on the greater series, which have the outer webs dark for one third of the length, and the inner webs tipped with brown; primaries and secondaries black; tertials brown near the tips.

Obs. A smaller species of Flamingo, *P. minor*, G. St.-Hil., visits the north-western portions of India in the cold season, coming from the west, its summer habitat being Africa. Its dimensions are—wing 12·5 to 13·75 inches, tarsus 7·0 to 8·4. Its plumage is much redder than in *P. roseus*, and especially in the breeding-season, when the throat is bright rose-colour, each of the feathers of the breast broadly centred towards the tip with cerise; the scapulars are rosy white, overlain by a number of long elongated, intensely cherry-coloured plumes; the secondaries, lesser and median wing-coverts brilliant cherry-colour, with narrow white tips; lower tail-coverts, flanks, and vent-feathers bright rosy, tinged with cherry-colour (*Hume*).

Distribution.—The Flamingo is frequently seen in large flocks on the east coast of Ceylon, from Jaffna southwards to Trincomalie, and from Batticaloa round to Hambantota. It is likewise met with on the west coast as far south as Puttalam, at which place large numbers are sometimes seen. I have myself seldom seen it in the Trincomalie district; but near Kirinde and Hambantota have met with numbers in March. It is for the most part, so far as I could ascertain, a migratory species, appearing in the island in October and November, and leaving again in April; but it is said by the moormen on the south-east coast to breed between Yāla and Batticaloa; and if this be the case it must be resident in this part of the island. This is a matter, and a very interesting one too, for future investigation; for as the bird does not nidificate in India, its nesting in Ceylon would be a remarkable feature in its economy.

In India it is abundant in some coast-districts, but towards Calcutta becomes rare. Jerdon writes as follows:—"It is abundant near Madras, in the Pulicat Lake; also between Madras and Pondicherry, and south towards Tuticoreen; it is also met with in the Northern Circars, at the great Chilka Lake, south of Cuttack, and occasionally near the mouth of the Hooghly and some of the Soonderbun rivers. In Central India and the Deccan flocks generally visit some of the larger tanks during the cold weather." Messrs. Davidson and Wenden recently state they have but rarely observed it in the Deccan; and the Rev. Dr. Fairbank remarks that it sometimes visits the larger collections of water there and also the saltpans in Bombay. In Sindh it is exceedingly numerous, Mr. Hume having met with it on the larger lakes of the Province in tens of thousands. "It is," he says, "a wonderful sight to see one of these enormous flocks rise suddenly when alarmed; as you approach them, as long as they remain in the water at rest, they look simply like a mass of faintly rosy snow. A rifle is fired, and then the exposure of the upper and under wing-coverts turns the mass into a gigantic brilliantly rosy scarf, waving to and fro in mighty folds as it floats away." It is very common in Guzerat and Kattiawar, but less so in Cutch and Jodhpoor, except at the Sambhur Lake, where it occurs in great flocks in the cold weather, remaining sometimes, when the season is wet, until May. Further north it is not uncommon in the Punjab. It is not found to the east of the Bay of Bengal, nor in the Mongolian or Chinese region, and it does not appear to range eastward of Turkestan, except as a rare straggler. Mr. Dresser states that it has been shot once at Lake Baikal; but this is the only record I find of its occurrence in Siberia. It is met with as a straggler, according to Severtzoff, in the western parts of Turkestan. Mr. Blanford found it on the Baluchistan coast, and further observes that it is said not to be uncommon on the Caspian, on which sea, I gather from other sources, it is principally found near the mouth of the Emba and on the shores of the gulf of Mertvoï-Koultouk. Elsewhere, in Persia, Major St. John met with it on the Shiraz plains. In Palestine Canon Tristram found it affecting the Kishon in winter, and also met with it in flocks in other parts; in Asia Minor, however, it is rare, and on the Black Sea is less common than on the Caspian. In Greece it is rare, but in Turkey not uncommon, although to the north on the Danube it does not seem, according to Mr. Dresser, to have occurred.

Its principal habitat in Europe appears to be Spain and Portugal, where it breeds, and the island of Sardinia, where it occurs in large numbers in the winter, from August till April, sometimes remaining until June. An extensive migration takes place from North-western Africa into Spain from February until May, the birds returning, according to Major Irby, in September; and this naturalist states that they breed in the marismas of the Guadalquivir. They do not all return, however, to Africa, as numbers are seen in

the winter in many places, among which may be mentioned the island of Iviza and Formentera. It is also found in winter in the Balearic Islands. In Malta it is only observed at irregular intervals, and in Italy it is not so common as in Sardinia. It is tolerably common in the south of France, and is said, writes Mr. Dresser, to inhabit the marshes of the Camargue and Aigue-Mortes. It is rare in the north of the country, and does not range as far as Holland or Belgium, although it is a straggler to Germany and has been seen on the Rhine in a considerable flock. It has extended as far east as Pomerania, but does not appear to be known in Poland or Central Russia.

In Africa it is abundant, according to Favier, in Morocco, migrating northwards through that country in April and May, and returning from August until December. In Algeria Loche found it at the large lakes; and Mr. Salvin speaks of vast numbers frequenting the lakes and lagoons near Tunis. In Egypt it is abundant, writes Capt. Shelley, in large brackish lakes, but is rather rare on the Nile itself. Von Heuglin, besides meeting with it in the same districts and at Suez, observed it as far south as the White Nile. It extends down the east coast to Mozambique, and thence into Cape Colony, where it is common, and said to breed at a place called Verloren Vley. Up the west coast it is very abundant in Damara Land, extending inland, according to Mr. Andersson, as far as Lake Ngami, and probably breeding to the north of Walvisch Bay, as also on Lake Ngami. It is likewise a visitor to the islands of the Atlantic, for Dr. Bolle records it from Canaria, and Dr. Dohrn and Captain Dampier testify to its occurrence in the Cape-Verd Islands.

Habits.—This remarkable bird passes its time wading in salt lakes and brackish lagoons, rarely ever being seen out of water, at the bottom of which it scoops up its food with the bill inverted, a position which this organ takes owing to the bird's neck assuming a perpendicular position when feeding, and the culmen being at the same time so much curved at the tip. The flattened upper mandible when thus inverted is exactly suited for either a scooping movement towards the bird's feet or a lateral motion, by means of which I suspect it takes in its food to some extent. It feeds on vegetable matter, animalculæ, and very small insects, worms, and crustaceans, rejecting the refuse through the lamellæ in the same manner as Geese and Ducks. It is extremely wary as a rule, though we read that when it first arrives in India it can be more easily approached. Owing to the open ground generally surrounding shallow brackish lagoons, and the fact of the bird usually wading at some distance from the shore, it is impossible to get near it once it becomes wary. In the south-east of Ceylon it is able to wade in the centre of the large leways when they are not very full, and it is then not possible to get a shot at it. The Flamingo is highly gregarious, associating in vast flocks, and when put up on the wing flies in a long line, portions of which, during the course of the birds, advance or fall behind, reminding the beholder, as Mr. Hume aptly writes, of a gigantic scarf. On the wing the neck is stretched to the front and the legs carried straight out behind; it rises from the ground with difficulty, striking the water with its wings before acquiring sufficient momentum to get fairly on the wing, after which it progresses with a steady flight. When a large flock are disturbed they rise with loud cries; the note, as I have heard it in the captive bird, is a hoarse cackle of two notes, in tone like that of a Goose. The Flamingo swims well; but Mr. Hume remarks that it carries its neck nearly straight and bent forward, not curved like that of a Swan, and at every stroke the leverage of its long legs naturally causes the head to jerk.

Nidification.—That the Flamingo nests in Ceylon is, I think, probable, although the locality is a very abnormal one. I have been informed that young birds have been brought to Hambantota from the direction of Batticaloa, and its peculiar mode of nesting was likewise described to me with tolerable correctness. It has not been discovered breeding anywhere in India; for, as we have seen, it leaves the country about May, and probably migrates into Persia and Arabia, if not to Northern Africa, to nest. Ornithologists of the present era have been singularly unfortunate in not discovering its breeding-haunts and obtaining perfectly reliable information concerning its nidification. Accounts received, however, from various parts of the world from the inhabitants of the districts in which it rears its young all point to the fact of its making a conical nest of mud with a hollow in the top for the reception of the eggs, and that the bird sits upon the latter with her legs dangling down. My friend Mr. Saunders endeavoured to find a breeding-place in Spain, but being unsuccessful he obtained (Ibis, 1871, p. 394) an account of the nesting of the bird from a Spaniard who

accompanied him on his trips; and this is in part as follows:—"The Flamingo always makes its nest in the flattest part of the marsh, in places where there is from three to four inches of water. The nest, which rises to about half a yard above the surface of the water, is made of mud, like that of a Swallow; its shape is almost cylindrical, but somewhat wider at the base. There is a slight concavity for the eggs, oval in shape, like the shape of the inside of a hat. When the bird is sitting, she has her legs stretched out behind, hanging in the air (that is to say, unsupported), like the arms of a man when he puts them behind his back and throws his shoulders forward. The complement of eggs is five; and the birds, when once frightened from their nests, do not return. To raise itself the bird 'scrambles' with its feet on the side of the nest till it lifts its body clear, and then it takes wing."

Further evidence is given by Captain Dampier, who wrote as far back as 1729, concerning the Flamingo as observed by him in the Cape-Verd Islands. From Mr. Dresser's work I transcribe the following passage from Dampier's 'Collection of Voyages,' i. pp. 70, 71:—"They build their nests in shallow ponds, where there is much mud, which they scrape together, making little hillocks, like small islands, appearing out of the water, a foot and a half high from the bottom. They make the foundation of these hillocks broad, bringing them up tapering to the top, where they leave a small hollow pit to lay their eggs in; and when they either lay their eggs or hatch them, they stand all the while not on the hillock but close by it, with their legs on the ground and in the water, resting themselves against the hillock, and covering the hollow nest upon it with their rumps; for their legs are very long; and building thus as they do upon the ground they could neither draw their legs conveniently into their nests, nor sit down upon them otherwise than by resting their whole bodies there, to the prejudice of their eggs or their young, were it not for this admirable contrivance, which they have by natural instinct. They never lay more than two eggs, and seldom fewer. The young ones cannot fly until they are almost full-grown, but will run prodigiously fast; yet we have taken many of them. The flesh of both young and old is lean and black, yet very good meat, tasting neither fishy nor any way unsavoury. Their tongues are large, having a large knob of fat at the root, which is an excellent bit, a dish of Flamingos' tongues being fit for a prince's table." The eggs are similar to those of a Gannet, but more pointed at one end; the texture is chalky, and they are white in colour with a green interior surface. I am indebted to Mr. Dresser for the measurements of two in his collection, which are as follows—3·64 by 2·3 and 3·5 by 2·25 inches respectively.

Order HERODIONES*.

Bill long, stout, straight and pointed in most, but curved in one group. Tarsi and feet long, the hind toe on the *same plane* with the anterior ones; middle claw serrated in one family. Toes webbed at the base, in many only between the outer and middle.

Young *heterophagous*, or helpless at birth, and requiring to be fed by the parent. One family (Ardeidæ) furnished with patches of down on the breast and groins.

Fam. PLATALEIDÆ.

Bill long, variable in character, in most curved, in some flattened, the tip expanding into a spatule; nostrils basal. Wings long. Tail short. Legs long; tibia bare much above the knee. Tarsus reticulate. Toes moderately short, joined at the base by a web.

Of large size. Sternum with two notches in the posterior edge. Tertials often elongated.

Genus PLATALEA.

Bill long, straight, flattened throughout, the tip spatulate or expanding into the shape of a spoon-handle; the extremities both decurved, that of the upper mandible projecting considerably over the under; nostrils situated in a groove covered by a membrane, the openings tubular; base of bill furnished with a more or less developed pouch. Wings with the 1st quill nearly as long as the 2nd and 3rd, the 2nd the longest. Legs moderately long, the tarsus reticulate in front. Toes considerably webbed at the base; the outer web much deeper than the inner.

PLATALEA LEUCORODIA.

(THE SPOONBILL.)

Platalea leucorodia, Linn. Syst. Nat. i. p. 231 (1766); Blyth, Cat. B. Mus. A. S. B. p. 276 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 114; Jerdon, B. of Ind. iii. p. 763 (1864); Holdsw. P. Z. S. 1872, p. 478; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1122 (1873); Legge, Ibis, 1875, p. 404; Hume, Nests and Eggs, iii. p. 628 (1875); id. Str. Feath. 1879, p. 114 (List B. of Ind.).

Platea leucorodia (Linn.), Dresser, B. of Eur. pts. 23, 24 (1873).

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* The heterophagous nature of the young of this order completely remove it from the Grallatores, with which many have associated it, and ally it unquestionably with the Steganopodes, which I place next to it.

Spatule, Buff.; *White Spoonbill*, Lath.; *Lepelaar*, Dutch in Ceylon. *Chamach-buza*, lit. "Spoon-Ibis," Hind.; *Chinta*, Bengal.; *Genta-muku konga*, Telugu; *Abu Mala qah*, Arabic; *Chapy-chundan*, Tamil (Layard).

Male (Sindh). Length 33·25 inches; wing 15·3, expanse 58·0; tail 5·0; tarsus 6·2; bill at front 8·4, varies in individuals from 8·2 to 9·7 (*Hume*).—*Adults* (England: Brit. Mus.). Wing 14·8 to 14·9 inches; tail 4·5 to 4·8; tarsus 4·8 to 5·2; middle toe and claw 3·2; bill at front 7·1 to 7·4.—*Adult* (Egypt). Length 29·0 to 31·0 inches; wing 12·0 to 13·5; tarsus 4·0 to 5·0; bill at front 6·65 to 7·0 (*Heuglin*).

Iris red; bill black, the plate or terminal portion yellow, with a black edge; loral space yellow; gular skin reddish yellow; legs and feet black. The gular skin extends down the throat in adults for a distance of 2½ to 3 inches from the base of the lower mandible.

Breeding-plumage (England: Brit. Mus.). Entirely white; sides and lower part of the neck buff-yellow, and a tinge of buff at the sides of the throat; an ample crest of long, decomposed, occipital feathers 2½ to 3½ inches in length.

Winter plumage. Similar to the summer dress, but without the crest, and more of the bill yellow.

Young. Bill dark ashy (*Jerdon*). Covered with white down; the bill with the plate from the time of birth—in fact I have found it well developed in the embryo before birth.

Immature (Holland). Wing 10·6 inches; tail 3·75; tarsus 4 8; bare tibia 3·8; bill at front 3·6. Bill yellow; iris brown; bare portion of skin at the base of the under mandible not developed. Plumage white, with the exception of the terminal portion of the first four primaries, which is blackish slate-colour; the shafts of the primaries, secondaries, and primary-coverts are black.

Obs. Indian specimens, judging by published data, are as large if not larger than European: an example in the British Museum has the bare gular skin reaching 2½ inches down the throat. I have not had an opportunity of comparing Ceylonese skins with those from other parts, as I was unable to procure a specimen while in the island, and have never met with this species in the collections of others. Von Heuglin looks upon the resident birds in Egypt as smaller than European, although there is but little difference in the eggs.

The Spoonbill of China and Japan has been separated by Temminck as *P. major*; but specimens which I have examined, collected by Mr. Swinhoe, are no larger than Indian birds, nor have they longer legs. It differs, however, in having scarcely any naked skin at the base of the bill. Males from China, before me, in Mr. Seebohm's possession, measure—wing 14·75 to 15·0 inches, tarsus 4·75 to 5·0, bill at front 7·6 to 7·9; the bill is black, with the tip yellow. A March specimen has the bill yellow; and an immature bird has the tips of the quills blackish.

There are two species in Australia (*P. melanorhynchus*, Reich., and *P. flavipes*, Gould). The former has the facial skin and all the bill black, and the latter has the bill and legs yellow. *P. tenuirostris*, Temm., found in Africa, has the legs and feet rosy red and the bill bluish green. All these species have the plumage white.

Distribution.—The Spoonbill is not an uncommon bird in the south-east of Ceylon and in the tank-districts of the northern half of the island. I have never seen it in large flocks, and I do not think it is an abundant species anywhere, though it is widely distributed in the regions in question. I found it breeding at Uduwila, near Tissa Maha Rama; but it was so wary, in spite of its eggs being endangered, that I could not succeed in getting any specimens. It is to be met with further north about Yāla, and thence towards Batticaloa. It is often seen about Kanthelai tank and in the Mullaittivu district. Mr. Parker informs me that it is tolerably common in the North-Central Province, and here and there found in the North-western Province about Puttalam and Kurunegala. Further south it is found at Chilaw, but not lower down the coast; and I have not heard of its occurrence anywhere in the south-west of the island, though Layard says it extends westward of Hambantota to Tangalla, which is about the limit of all such large dry-climate species.

This bird is generally distributed throughout India, but is nowhere very abundant. It is common in parts of the Deccan, breeding there in April and May (*Davidson*). Further north, in the direction of Chota Nagpur, Mr. Ball records it only from Orissa, north and south of the Mahanadi river, and from Raipur. It is not common about Calcutta, and is omitted entirely from Mr. Cripps's Furreedpore list. I find no mention of it to the eastward of the Bay of Bengal; and beyond the Burmese countries, in China, it is replaced by

P. major. Turning westward to India again, it is distributed throughout Bengal towards Rajpootana and Sindh, in which provinces, as well as in the surrounding region, it is more or less common. Mr. Hume met with it in large flocks along the larger rivers of the Punjab, and on the Indus in Sindh; but on the lakes and broads it was not frequent. To the north of India I do not find it recorded by Dr. Scully from Kashgharia, and in the Mongolian region it is, according to Prjevalsky, replaced by the Chinese bird. In Turkestan, writes Severtzoff, it occurs on passage in cultivated districts up to 1000 feet, and breeds in the south-eastern and north-western districts of the country. It extends northwards into Siberia; and Radde met with examples in the Ussuri country in the far east which, he says, do not differ from the European bird.

It is apparently rare in Palestine and Asia Minor, but is common, according to Von Nordmann, on the shores of the Black Sea, as also along the Danube as far up as Hungary, in both of which districts it breeds. It is also found on the Caspian. In Greece it occurs in large numbers on passage about the time of the equinoctial gales; and Lord Lilford writes that it is common about Petala and the Gulf of Lepanto. It is seen on migration in Malta and Sicily, but in Sardinia is common in the winter. In Tuscany, however, it is met with chiefly in the spring. In Southern Spain it is a bird of passage likewise, being abundant in the marshes of the Guadalquivir, where it occasionally breeds, according to Lord Lilford. It is a summer visitant to Holland and Germany, but is mostly a bird of passage in France, and is now-a-days only a straggler in summer to the British Isles, although in the early part of the last century it bred in the eastern counties. It has been frequently obtained in Ireland as a stray visitor, and has occurred in Scotland, as also in the Orkneys and Shetlands, and is now, according to Mr. R. Gray, an occasional visitor to the Hebrides. In Denmark and Scandinavia it is very rare, although it wanders as far north as Lapland and Finland, and has even once occurred near Archangel. Concerning its occurrence elsewhere in Russia Mr. Dresser writes:—"Sabanäeff records it from the Government of Vladimir; and Bogdanoff met with it in the spring at Lizran. Sabanäeff found it breeding on the skirts of the Shadrinsk and Cheliabiansk districts, and met with it as high as 56½° N. lat." It is found in Poland, and is said to nest in the marshes of Silesia. Turning now from this outline of the Spoonbill's distribution in Europe to the continent of Africa, we find it recorded by Favier as migrating through Morocco in March, April, and May, and returning in October; but it is not found there in winter, although Loche speaks of it as occurring in Algeria at all seasons. Captain Shelley writes that it is plentiful in Egypt and Nubia, while Von Heuglin met with it along the shores of the Red Sea and southward to the Somauli coast; in the Dahlak archipelago he visited large breeding-colonies in June. Southward it is replaced by the allied species, *P. tenuirostris,* which extends to Natal. I do not find it recorded from the west coast of Africa; but nevertheless it occurs in the Canaries as a visitor, and also in Madeira and the Azores.

Habits.—From my experience of the Spoonbill in a state of nature I should say it was a very shy bird. I found that when frightened away from their nests those which were met with near Tissa-Maha-Rama flew round and round the tank, and crossed and recrossed it, keeping high up in the air, but would not come near the trees in which their nests were placed so long as I was there. It flies rapidly, with powerful strokes of the wings, carrying its neck straight out. Small flocks, as I have observed them, fly together, but large numbers, writes Von Heuglin, form a singular double line, or sometimes a triangle with unequal sides. When perched on the tops of trees or resting on the ground the neck is gracefully curved and the body held tolerably upright; "while moving about in search of food," remarks Mr. Dresser, "it walks leisurely and slowly, and has a peculiarly grave and sedate gait, as if determined to quarter the ground in a thoroughly business-like manner, and not to hurry itself." It is said by Naumann to have a deep note, and to be noisy at its breeding-places; I did not hear it utter a sound at Uduwila. It makes a clattering noise with its bill, like the Stork. Its food consists of insects, larvæ, small crustacea, frogs, &c. more than fish; and when feeding in shallow water it moves its bill from side to side, taking up its food with the curious spatule at the tip.

The Spoonbill frequents marshes and the borders of freshwater lakes, tanks, and rivers.

Nidification.—In the south-east of Ceylon this species breeds in March. Six or eight pairs were nesting at Uduwila in 1872, the nests being placed on the same trees with those of the Pelican-Ibis; they were situated low down, and in some cases small branches were bent down to form a foundation for the structures, which were made of tolerably large sticks and were rather massive. The eggs, which were two in number,

were reposing on a lining of small twigs; they were broad ovals, pointed at one end, coarse in texture, dull white, with a few light rusty-brown or sepia-smeared blotches near the larger end. The dimensions of two specimens are 2·5 by 1·85 and 2·45 by 1·8 inch.

In India, according to Mr. Hume, it often breeds in very large colonies together with nearly-related species, notably "Shell-eaters," nesting on tamarind- and peepul-trees frequently in villages. He describes the nests as large platforms of sticks from 2 to 3 feet in diameter. In most, the number of eggs does not exceed four, although a few contain five. The markings consist more or less of smudgy and ill-defined blotches and spots, with here and there a hazy spot, streak, or cloud intermingled; in some eggs they are clear bright brown, reddish brown, and even almost black, while in others they are yellowish brown or pale sepia. The eggs vary from 2·4 to 2·95 inches in length, and from 1·68 to 1·95 in breadth.

This species occasionally nests on reeds when there are no trees in the localities in which it has taken up its quarters. The nests in this case are constructed of "reeds bound together by weeds, which are piled up a few inches above the water's edge; over this dry reeds are placed in various directions to form the body of the nest." Nests of this description were found at Erzeroum by Messrs. Dickson and Ross, and described in the Proc. Zool. Soc. 1839.

Genus TANTALUS.

Bill very large, wide at the base, and much compressed to the tip, which is curved and cylindrical in both mandibles; under mandible somewhat inflated at the sides near the gape; nostrils basal, horizontal, placed near the culmen. Wings large, pointed, the 3rd and 4th quills the longest, the 1st considerably shorter than the 2nd. Tail short. Legs lengthened, much of the tibia bare; tarsus reticulate. Toes long, web joining the anterior ones well developed; nails very short.

Of large size. Head nude in the adult; under tail-coverts lengthened.

TANTALUS LEUCOCEPHALUS.

(THE PELICAN-IBIS.)

Tantalus leucocephalus, Forst. Ind. Zool. p. 20 (1781); Blyth, Cat. B. Mus. A. S. B. p. 275 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 115; Jerdon, B. of Ind. iii. p. 761 (1864); Holdsw. P. Z. S.. 1872, p. 478; Legge, Ibis, 1875, p. 404; Hume, Nests and Eggs, iii. p. 626 (1875); id. Str. Feath. 1879, p. 114 (List B. of Ind.); David & Oustalet, Ois. de la Chine, p. 452 (1877).

Der weissköpfige Ibis, Forster; *Stork* of Europeans in Ceylon; *Brand-Gans*, lit. "Fire-Goose," Dutch in Ceylon. *Dokh*, *Jaunghal*, Hind.; *Janghir*, Bengal.; *Lamjang*, Sindh; *Yerri Kali-konga*, Telugu; *Singa nareh*, Tamils in India; *Changa vella nary*, Tamils in Ceylon (*nary* being the name for Stork).

Datuduwa, lit. "Sickle-bill," Sinhalese.

Adult female (Ceylon). Length 40·0 inches; wing 21·0; tail 6·5; bare tibia 7·5; tarsus 7·75; middle toe 4·0, claw scarcely projecting beyond it; hind toe 1·7; bill to gape 8·2, at front from forehead 9·0.—*Female* (Sambhur). Length 38·0 inches; wing 19·5, expanse 69·75; tail 6·2; tarsus 9·2; middle toe and claw 4·7 (?); bill from gape 9·2 (*Adam*).—*Male* (Furreedpore). Length 41·8 inches; wing 20·0; tail 6·25; tarsus 8·1; bill from gape 10·08 (*Cripps*).

Iris yellowish grey, mottled with brown; bill red; naked skin of head, throat, and face orange; legs and feet fleshy red. Mr. Cripps states the iris to be "light brown," and Mr. Adam "pale brown."

Head, face, and upper part of throat bare, the naked skin extending back as far as the nape and beyond the face to the ear-coverts, passing down the throat to a point about 4 inches from the chin. Plumage glossy white, with the exception of the tail, primaries, secondaries, underlying tertials, and scapulars, and all but the greater wing-coverts, the entire under wing, axillaries, centre of the flanks, and a broad band across the breast, which are glossy black, illumined with green; the entire wing-coverts above and beneath and the flanks and breast-band with broad satiny white margins; the greater wing-coverts tinged with rosy, as also the lower back and upper tail-coverts; terminal portion of the tertials fine rosy red, the barbs open, and the extreme tips satiny white; the under tail-coverts, which have the basal parts of the webs decomposed, and the barbs furnished with a supplementary web, reach 1½ inch beyond the tail and are faintly tinged with rosy.

Obs. Some examples are without the black band across the chest. One in the British Museum measures wing 19·5 inches, tarsus 8·5, bill to gape 9·9, and has the breast and all the wing-coverts and longest tertials completely white. This plumage is apparently that of a fully-aged bird. Another (wing 21·5 inches, tarsus 4·5, bill to gape 10·0) is identical with a Ceylonese specimen.

Young (bird reared from the nest). Bill first of all black when the nestling is unfledged, and at about a month old with a greenish tip, a few weeks after which the green advances up the bill and the tip at the same time becomes yellowish; iris brown; legs and feet flesh-colour.

The *nestling* is covered with brownish down at first; and when fledged the head and throat are covered with feathers, which, together with those of the neck, are brown; the back and wing-coverts fine slate-grey, the latter with whitish borders, and the tertials tinged with reddish from the very first.

At six months, in a caged example, the iris was hazel; bill dusky greenish, with about the terminal half yellow, which colour rapidly encroached on the green; tarsi and feet fleshy reddish.

Head and neck neutral brown, the feathers tipped pale, gradually paling into grey on the lower neck, interscapular region, scapulars, and back; the scapulars and wing-coverts dark on their inner webs and towards the bases of the feathers; lesser wing-coverts and under wing dark iron-grey, margined pale (these feathers had been entirely grey a short time previous, the centres first of all becoming dark, and that colour spreading over the feathers to the edges); tertials silvery grey, with black shafts and dark bases, the outer webs overcast with rose-colour; quills

and tail-feathers black, with a strong greenish lustre; breast greyish, paling into white on the lower parts; under and upper tail-coverts white; under wing-coverts along the edge of the wing tipped with reddish white.
The adult plumage is apparently put on at the next moult.

Distribution.—This fine bird, a giant among Ibises, is tolerably common in many parts of the northern half of the island, and is decidedly numerous on the south-east coast from the southern parts of the Batticaloa district down to Hambantota. I met with large flocks in the Magam Pattuwa near Tissa Maha Rama; and Mr. Bligh saw great numbers in the Yāla district in the early part of last year. It collects in large numbers at Kanthelai and Minery tanks during the south-west monsoon, and is, I understand, common in the Mullaittivu district and at Padewiya tank. In the immediate neighbourhood of Trincomalie I rarely saw it. It is not uncommon in the direction of Puttalam, and, I apprehend, breeds at Nikaweratiya tank. It is not found on the west coast south of Chilaw, nor does it extend westward of Tangalla, except perhaps as a straggler.

In India the Pelican-Ibis is very abundant in some parts of the empire. It appears to be particularly common in portions of the Deccan (Ahmednagar, &c.), where it breeds in large numbers in the middle of certain villages; in other districts of this region, however, it is only sparingly distributed. In Chota Nagpur it is rare; Mr. Ball procured it on the Koel river, and records it from Lohardugga, Raipur, Jaipur, and Bustar. Throughout Bengal and the North-west Provinces it is pretty well distributed, but appears to become rarer towards the north-west, although it occurs in the Sambhur-Lake district, Guzerat, Cutch, and breeds in Western Sindh on the eastern Narra. In the Punjab, according to Mr. Hume, it does not occur. Turning eastwards, we find it rare in the immediate vicinity of Calcutta; nor is it common in Furreedpore, though a rainy-season visitant. I do not find it recorded from Upper Pegu nor from the Irrawaddy delta; but in Tenasserim proper Captain Wardlaw Ramsay met with it at Tonghoo, Mr. Davison at Tavoy, Captain Beavan in large numbers at Thatone creek; and elsewhere it has been procured on the Pakchan. It does not extend further south into the peninsula, being there replaced by the closely-allied species *T. lacteus*.

Habits.—The Pelican-Ibis frequents the edges of tanks, rivers, and salt lagoons; it is frequently seen alone and often in small parties of half a dozen or even less; now and then, however, in a favourable district on the borders of some fine tank or brackish lagoon, where there is an abundance of food, one sees a large flock assembled, which present a very handsome appearance, their glossy white plumage and red tertials showing to advantage in the glaring sun. Its great length of leg enables it to walk in deep water, where it succeeds in catching comparatively large fish, which it bolts with the greatest ease. Those who have observed it closely say that it stalks about with its bill in the water and held partially open, so as to seize its prey with the greater rapidity. Blyth has noticed it feeling about in the sand with its foot for any thing that may be moving, thrusting its leg forward for the purpose. Its flight is somewhat peculiar; it often makes a few rapid strokes of its long wings, and then sails on an immense distance with motionless pinions; at other times it proceeds forward with regular beats and at a considerable speed, its long red legs stretched out behind being very conspicuous. It soars round and round like the Shell-Ibis, mounting to a great height. It is a most voracious bird, devouring any thing that comes in its way—fish, frogs, crustacea, mollusks, reptiles, &c. The young bird which I reared, and which lived six months and died from inflammation brought on by the damp weather of the Galle district, lived on meat, lizards, &c., scraps from the kitchen, and, in fact, would eat almost any thing that was thrown to it, either cooked or raw. It roamed about my little compound, often taking up its stand near or even in the kitchen, and while young would squat down on its tarsi when hungry, flap its wings, and dart out its bill. It had a great antipathy to children and dogs, and when approached by them would become very angry, squatting in the position just mentioned, its toes extended, snapping its bill loudly, and uttering a harsh and guttural crake. Fish and large pieces of meat it bolted with surprising quickness, and after being fed would walk about with its bill wide open, as if asking for more! Fish were of course swallowed, after the manner of Cormorants and Pelicans, with the head foremost. It stood much on one leg, and when resting would always squat down on the tarsus. When it grew up I confined it in an aviary with a Sea-Eagle; and as an instance of its voracity I may mention that one day I was taking a large rat in to the Eagle, and having to squeeze myself through a small doorway had passed in the hand holding the rat before I got through myself, when the Ibis catching sight of the dainty morsel ran forward, seized it, and

swallowed it head foremost before I could get into the aviary! Mr. Cripps writes of a pair he kept that "when being fed they would clatter the mandibles, shaking the head from side to side all the while, and uttering a hoarse croaking noise." At nights they roosted on the roof of a storehouse, and in a storm steadied themselves with their wings half open and their heads pointing to windward.

Nidification.—The only breeding-place of this Ibis which I visited in Ceylon was the colony at Uduwila tank. There, among the numerous species nesting at the time of my visit, were about a dozen pairs of the Pelican-Ibis. The nests were placed on the same thorny trees as those of the Pelicans and Shell-Ibises, and were large structures of sticks, some of them about 2 feet in diameter; the interior was almost flat and lined with smaller twigs; they were placed on horizontal boughs, or at the tops of others, in which case the small branches were bent down to form a foundation for the nests. The young, which were all hatched, climbed adroitly along the branches to escape being caught. There were three in almost every nest.

In India this bird is partial to banyan- and tamarind-trees, and sometimes nests in large numbers in the centre of a village, as many as twenty nests being placed on one tree. Burgess, who gives an account of a building-place in the Deccan, describes the trees, both outside and inside the walls of the village, as thickly covered with nests; the old birds moved off at early dawn to catch fish for their young, and returned about 9 or 10 o'clock; and such quantities of fish were brought by the birds that the people of the village ate large numbers which dropped from the nests. Mr. Hume observed that the young in the nests of a colony which he visited squatted down to be fed by their parents, although they stood bolt upright until the old birds arrived at the nests. The number of eggs laid varies from two to eight; but the normal numbers are three or four. They are devoid of gloss; some are pyriform, others almost perfect ovals, of a dull white colour, occasionally with a few dingy brown spots and streaks. They vary in length from 2·58 to 2·95 inches, and in breadth from 1·75 to 1·98 (*Hume*).

Genus ANASTOMUS.

Bill moderately long and straight, of a solid but fibrous structure, deep, laterally compressed; the culmen curved, the base descending to the forehead; gonys much curved; nostrils oval, wide, and horizontal, placed near the base. Wings and tail as in the last genus. Legs and toes somewhat more slender than in *Tantalus*; the webs smaller, and the membrane at the sides of the toes less developed.

Bill acquiring a worn space with age, the result of attrition.

ANASTOMUS OSCITANS.

(THE SHELL-IBIS.)

Ardea oscitans, Bodd. Tabl. Pl. Enl. p. 55 (1783).

Anastomus oscitans (Bodd.), Blyth, Cat. B. Mus. A. S. B. p. 276 (1849); Jerdon, B. of Ind. iii. p. 765 (1864); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 115; Holdsw. P. Z. S. 1872, p. 479; Legge, Ibis, 1874, p. 31, et 1875, p. 404; Hume, Nests and Eggs, iii. p. 630 (1875); id. Str. Feath. 1879, p. 114 (List of Ind. B.); Bingham, Str. Feath. 1876, p. 212.

Le bec ouvert, Buff. Pl. Enl. 932; *Shell-eater*, sportsmen in India. *Gungla*, *Ghongal*, *Dokar* (Behar), Hind.; *Tontė bhanga*, Bengal.; *Kha-yoo-tsoot*, Arrakan (Blyth); *Gulu konga*, Telugu; *Natte-kuti-nareh*, Tamils in India: all these names having references to shells (Jerdon); *Karunary*, Tamils in Ceylon.

Gombelle-koka, lit. "Snail-Koka," Sinhalese.

Adult male and female (Ceylon). Length 31·0 to 32·5 inches; wing 16·0 to 17·0, expanse 59·0; tail 6·0 to 7·0; tarsus 6·0 to 6·3; bare tibia 4·5; middle toe 3·4 to 3·6, claw 0·5; hind toe 1·4; bill to gape 6·0 to 6·1, along culmen 6·5; space in anterior portion of bill 0·4 in height, extending 3·0 from tip towards gape.—*Male* (Furreedpore). Wing 16·75, expanse 59·50; tail 7·5; tarsus 6·25; bill from gape 0·4, at front 6·3 (*Cripps*).

Iris grey; bill reddish, patched on the sides with olivaceous; in some grey, reddish at the base and along the culmen; loral skin dull blue; bare skin at base of lower mandible greenish leaden; legs and feet fleshy pink or reddish mingled with yellowish. The iris appears to be brown in some, according to Indian observers; but I have always found it grey.

Breeding-plumage (Ceylon). Head, neck, back, rump, and wing-coverts greyish white, paling on the underparts into pure white; interscapulary region and upper scapulars tinged with grey; longer scapulars, tertials, quills, primary-coverts, winglet, and tail black, with purplish and green reflections; occiput faintly tinged with rosy; axillaries and under wing-coverts pure white.

This plumage I take to be worn only by fully adult birds. During the breeding-season in the south-east of Ceylon I have shot specimens in the so-called *winter plumage*, which consists in the white portions being sullied with leaden grey, darkest on the occiput and interscapular region. This dress, I apprehend, is worn by birds not fully adult while breeding.

Young nestling. Iris brown; bill dark green; naked skin about the chin and base of the bill and the orbits greenish black; legs brown, tinged with pinky red. Bill 3·2 to 3·4 inches from gape. (*Bingham.*)

Plumage "light grey, a little darker on the head and neck, where the feathers are short and the webs hair-like; the upper back, winglet, primaries, secondaries, tertials, scapulars, and tail black, shot with green and purple reflections." (*Bingham.*)

Immature, about six months old (Ceylon). Bill to gape 4·6 inches; tarsus 5·5. No worn space in the mandibles. Bill dark leaden; head, neck, underparts, and wing-coverts grey, the head and nape washed with brown, the interscapular region and back brown; scapulars brownish black; quills, tertials, and tail black, the secondaries with a purple and green lustre.

Obs. There is never any trace of the worn space in the mandibles when the bird is young, and, according to Lieut. Bingham, it is not until the bird is 4 or 5 months old that the space begins to show itself.

Another species (*Anastomus lamelligerus*) inhabits Africa, and is remarkable for the singular lamellated structure of the feathers of the chest and belly. The plumage is black, illumined with green and purple; chest dark brown. "Wing 14·75 to 16 inches; tarsus 4·75 to 5·84; bill at front 6·15 to 6·84." (*Heuglin.*)

Distribution.—This is the most widely distributed species of its family in Ceylon, for besides being found in the extreme north, here and there throughout the northern forests, in various localities on the eastern side of the island, and abundantly frequenting the south-east of the island, it inhabits the extreme south from Matara round to Amblangoda on the west, and further has been shot as a straggler near Colombo. It is numerous in the Hambantota and Yāla districts, inhabiting, however, the sea-board more than the interior; thence northward it is found round the skirts of the Park country to Batticaloa, but is not so common there as in the first-named parts. Large flocks are seen sometimes at Kanthelai, and in common with other Ibises it frequents the great Padewiya and other suitable tanks in the Vanni. It is plentiful in parts of the North-western Province. In 1872 a young bird was shot on the Kelaniganga not far from Mutwal; and there is a permanent colony on the Amblangoda Lake, a portion of the shores of which are flat and shallow, furnishing a supply of suitable shell-fish; but I have never seen it at the Bolgodde Lake, as it is unsuited to the bird's habits. Layard discovered a breeding-colony near Matara.

In parts of India it is very abundant where there are large rivers, tanks, and marshes, particularly in Bengal, according to Jerdon and more recent observers. It collects in the Doab in large numbers to breed. In Jodhpoor it is not uncommon, though it is not evenly distributed throughout the province; and further east, in Sindh, Cutch, and Kattiawar, it has not been noticed, although it occurs sparingly on tanks and rivers in Guzerat. In the Deccan it is not uncommon, and, according to Davidson and Wenden, is resident in the Bhima. Jerdon makes no mention of its occurrence on the Malabar coast; but in all probability it frequents suitable localities there and in the Carnatic. Turning northward again we find it pretty common in Chota Nagpur, being found sometimes on the beds of large rivers in hilly districts even. Mr. Ball cites it as occurring in the Rajmehal hills, Manbhum, Lohardugga, Singhbhum, Sirguja, Sambalpur, Orissa, Nowagarh, Karial, Jaipur, and Bustar, while Mr. Hume has had it sent him from Raipur. In the Furreedpore district of Eastern Bengal it is pretty common from March until September, and in Sylhet it is to be met with in the cold weather (*Cripps*). It appears to extend to the eastward of the Bay in very limited numbers. It is rare in Pegu, according to Mr. Oates, and further south it is not found at all in Tenasserim. The southern portion of Burmah would appear, therefore, to be its furthest limit in this direction; and in the islands of the Bay, which are destitute of all of the Plataleidæ, it is of course not found.

Habits.—This singular bird affects the borders of salt lakes, lagoons, marshes, tanks, and estuaries in Ceylon; but in India is also found along the margins of large rivers, and smaller streams even, flowing through hilly districts. In our island the maritime regions furnish it with localities suitable to its tastes, and it is there that it is mostly found. Out of the breeding-season it associates in small parties, but while nesting sallies out to feed in large flocks. I once came upon a flock of more than 100 on some grass-land round the margins of Sittrawella tank, and they presented a fine appearance as they stalked slowly about or stood erect attentively regarding me as I issued from the surrounding forest into the open. They were not particularly shy, allowing me to get within a long shot of them before rising. Though not swift on the wing, the Shell-Ibis is a bird of powerful flight, and delights in soaring in the air at a great height, after the manner of Sea-Gulls; when disturbed at their nesting-place they mount with a gyrating flight, and commence flying in wide circles, some in the opposite direction to others. It is a most inveterate consumer of shell-fish, searching about with its bill and sometimes with its feet in the mud for its prey, which, when found, it takes to a convenient spot and, holding it under one foot, breaks in the shell with a blow of its powerful bill and pulls out the contents. Smaller shells are, writes Lieut. Bingham, who has devoted much attention to its habits, crushed between its powerful mandibles and swallowed by repeated jerks of its head. It is probably owing to this habit, he remarks, that the attrition of the mandibles is caused; and such perhaps is the case; but if so, it is singular that the space does not exist at the point of greatest power, namely near the gape, where one would suppose the bird to seize the shell it desired to crush. Furthermore, although the edges of the under mandible have the appearance of being worn away by friction, those of the upper present a sort of hard leathery-looking appearance, not indicative of being caused by great pressure. The Shell-eater perches and roosts on trees, generally flying up to the topmost branch. The neck is carried almost straight, both in walking and when the bird is at rest.

The following interesting paragraph, appertaining to the habits of this species in confinement, is contained

in Jerdon's 'Birds of India':—"Many years ago several Shell-eaters were brought to me alive for the purpose of training Bhyri, and these, as is usual, to prevent them struggling or fluttering, had their eyes sewn up. To feed them the falconer had a quantity of the large *Ampullaria* brought, which were placed before the captive and blind Shell-eaters. The bird secured a shell by its feet and after sundry alterations of its position succeeded in cutting off the operculum as clearly as if it had been done by a razor, but so rapidly that I was unable to see the exact way in which it was accomplished. It then inserted the tip of its clumsy beak into the open mouth of the shell, and after working it about for a short time pulled out the entire shellfish almost to its utmost tip. I saw this process repeated many times, and I cannot conceive that a bird which takes the trouble to extract the animal from the comparatively brittle *Ampullaria* should require to bruise the more hard and solid shell of the *Unio*." Although shellfish form the main food of the Shell-Ibis, as all its native names testify, it will eat frogs and fish, but will not live long in confinement, writes Lieut. Bingham, if kept long on an exclusively fish diet. This writer also says that at night they utter a curious laughing chattering noise, with frequent clatterings of the bill. These birds are caught, according to an informant of Dr. Jerdon, by means of a bamboo with a noose attached, which is bent down and fixed lightly in the ground by a small peg, to which an *Ampullaria* is fixed. "The Shell-eater hunting about finds the shell, and moving it to get at its contents the peg is withdrawn, the bamboo flies up, and the noose catches the bird, which remains dangling in mid air."

Nidification.—The Shell-Ibis breeds in the south of Ceylon in January, February, and March. I found them nesting in considerable numbers at Uduwila tank; but at the time of my visit the young were all hatched and some of them well grown. The nests were large flat structures of sticks, the egg-platforms being lined with small twigs and roots; they were placed in the same trees with the nests of the last species. The old birds flew up into the air, mounted to a great height, circling round and round like Herring-Gulls, and frequently descended from a great altitude with a terrific rush and booming noise of the wing until they almost touched the trees, from which the momentum of their heavy bodies enabled them to mount again in the same swoop. Beyond this they showed no sign of defending their nests. Layard refers to the assertion of the natives that these birds "defended their nests with such pertinacity that they feared to mount to them." This of course was nothing more than the common excuse made by the country people on all such occasions.

In India this species breeds in July and August, great numbers repairing to the Central Ganges, Doab, for this purpose. They build on lofty Peepul- and Neem-trees, on which occasionally as many as sixty-two nests may be seen. They are repaired year after year, and are circular platforms about 20 inches in diameter, with a shallow depression in the centre, which is sometimes lined with tufts of grass or a few leaves. The eggs vary in number from 2 to 5, and are at first pure white, becoming afterwards stained to a deep yellowish-brown colour; they are oval in shape, the average size of two specimens being 2·2 inches in length by 1·49 in breadth (*Bingham*). A large series vary, according to Mr. Hume, from 2·0 to 2·52 inches in length, and from 1·48 to 1·82 in breadth.

Genus IBIS*.

Bill long, curved throughout, slender at the tip, high and wide at the base, the sides perpendicular and suddenly compressed to about the middle; culmen rounded at the tip and elevated above the naral groove at the base; sides of the forehead higher than the centre; naral groove running parallel to the culmen and extending to the tip; nostrils linear, placed in a horizontal membrane. Wings with the 2nd quill the longest; tertials equal in length to the primaries. Tarsus reticulate. Toes stout, bordered by a narrow membrane.

Head bare in the adult. Tertials lengthened and decomposed, and the pectoral feathers elongated in the breeding-season.

IBIS MELANOCEPHALA.

(THE BLACK-HEADED WHITE IBIS.)

Tantalus melanocephalus, Lath. Ind. Orn. p. 709 (1790).

Ibis melanocephala (Lath.), Vieill. Nouv. Dict. Hist. Nat. xvi. p. 23 (1817); Elliot, P. Z. S. 1877, p. 488; Salvadori, Uccelli di Borneo, p. 359 (1874); Hume, Str. Feath. 1879, p. 114 (List B. of Ind.).

Threskiornis melanocephalus (Lath.), Blyth, Cat. B. Mus. A. S. B. p. 275 (1849); Jerdon, B. of Ind. iii. p. 768 (1864); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 115; Holdsw. P. Z. S. 1872, p. 479; Legge, Ibis, 1875, p. 404; Hume, Nests and Eggs, iii. p. 632 (1875).

Black-headed Ibis, Lath.; *White Ibis*, *White Curlew*, Indian sportsmen. *Munda*, Hind., also *Sufeid buza* and *Kachia tori* (Purneah); *Sabut buza*, Bengal.

Tattu-koka, lit. "Bald Koka," Sinhalese.

Adult male (Ceylon). Length 29·0 inches; wing 14·5; tail 5·0; tarsus 4·25; bare tibia 2·5; middle toe 3·2, claw (straight) 0·7; hind toe 1·2; bill to gape (straight) 5·4, height at gape 1·2, width across hollow at base of culmen 0·85.—*Male.* (Sambhur Lake) Length 30·9 inches; wing 15·3, expanse 53·3; tail 5·1; tarsus 4·3; bill at front along curve 6·2 (*Adam*). (India: Brit. Mus.) Wing 13·5 inches, bill to gape (straight) 4·7.

Iris brown, "blood-red in some" (*Jerdon*); bill black; legs and feet black or blackish purple; bare skin beneath the ulna red.

Breeding-plumage (India: Brit. Mus.). Head and neck bare, the skin black, extending down the hind neck 4 inches from the occiput, and on the fore neck 5 inches from the chin. Plumage white, the scapulars and tertials decomposed or with open barbs, lengthened and tinged with dark grey near the tips; plumes at the lower part of the fore neck lengthened.

Apparently it is only old birds which have the quills pure white; generally the shafts are black with a portion of the tips of the feathers. Mr. Adam instances one with a "narrow black line, about an inch in length, on only one of the quills." In some examples the bare skin at the back of the neck is crossed by red bars; and other specimens have the tertials pure white.

* The members of the group to which this genus belongs form the subfamily Ibidinæ of some authors. The present and the following species are the sole representatives of this subfamily in Ceylon.

In *winter* the scapulars and tertials are not decomposed and the breast-plumes are absent.

Young, immature (March, Ceylon). Iris brown; bill black; legs and feet black.

Neck and head feathered nearly to the anterior corner of the eye and in a point to the base of the culmen; plumage of the head and face, passing back from the lower edge of the under mandible onto the back of the neck for about 4 or 5 inches, black; the throat and all the rest of the neck and plumage white; shafts of the quills and tertial feathers black, the terminal portions of the webs of the latter blackish grey; outer webs of the first two primaries and the edge of the terminal portion of the first three blackish grey. The scapulars and tertials are not lengthened, and the breast-plumes are absent. At the first moult the feathers of the head and neck are said to become white, and in the following year are shed altogether and the skin left bare. I am under the impression that birds breed in this immature plumage, as I found them in such at a breeding-colony in the south of Ceylon.

Obs. This Ibis is closely allied to the Sacred Ibis of Egypt, *I. æthiopica*, Lath., which differs from it in having the tips of the primaries in the adult greenish black, the tertials more lengthened and blacker at the tips. In Africa this bird extends as far south as the Transvaal, and is united by Mr. Elliot with Gould's Australian species, *I. strictipennis*, which was separated by the latter author on account of the lengthened feathers of the lower part of the throat; but this appears to be a character of the African bird in the breeding-season. It is singular, however, that this species is not found in Asia, particularly in India, if it is identical with the Australian bird. The wing-measurement of *I. æthiopica* is 14 inches, bill along culmen varying from 5 to 8 inches.

Distribution.—The White Ibis is found here and there throughout the northern forests in the vicinity of large tanks, and extends down the east coast to the Hambantota district, probably not passing much to the westward of the Wallaway river. About Yāla it is rather numerous. It is rare in the Trincomalie district, although it is said to be not uncommon about Mullaittivu. It is pretty common in the North-western Province, and breeds as far south as the tank at Nikaweratiya; but I imagine that it does not extend down the west coast further than Chilaw. Mr. Holdsworth has seen it near Aripu, and it is also found at Manaar sometimes, and northward along the coast to Jaffna.

According to Jerdon it is not uncommon in many parts of India, and it is apparently as numerous, if not more so, in Sindh and the surrounding provinces as anywhere else, parts of Jodhpoor being perhaps an exception, as I observe that Mr. Adam only once met with it at the Sambhur Lake. It is common in the Doab, and is distributed throughout Chota Nagpur, but nowhere abundant, localities cited in this district being Manbhum, Lohardugga, Sirguja, Sambalpur, Orissa, Nowagarh, Karial, Jaipur, Bustar, and Raipur. In the Deccan it is not rare, and has been observed in that part by Mr. Davidson from October till about July, most probably breeding there. Looking eastward, I find it tolerably numerous, according to Mr. Oates, on plains intersected by the tidal creeks of Burmah; and in Tenasserim it is not uncommon in similar localities of the central portion of the province. In the peninsula of Malacca it is probably found, though I do not find any record of its occurrence there; but Schlegel notes it from Java: I apprehend also that Temminck's Sumatran Ibis belongs to this species; and it is doubtfully recorded from Borneo by Salvadori. In the Moluccas, according to Elliot, the Australian and African species reappears, and extends along the east coast of Australia as far south (as a straggler) as Victoria. It is, however, probable that owing to its isolated geographical range the Australian species is after all distinct from the African. Careful investigation will no doubt bring some characters to light (difference in size perhaps, or the constant presence of the red bars on the hind neck, or peculiarities in habits) which will serve to establish Gould's determination beyond dispute. Finally, our bird is found in the summer in China, and probably extends, according to David and Oustalet, as far north as the marshes of Mantchouria.

Habits.—This fine Ibis associates in flocks during the non-breeding season. In Ceylon, however, where it is not very abundant, it goes about in small parties of ten or a dozen, frequenting the borders of large tanks and wet grass-bunds near estuaries of rivers and tidal creeks; occasionally, however, large flocks are seen in the North-western Province and on the south-east coast. In India it is found, says Jerdon, on the banks of rivers, about tanks, marshes, and paddy-fields, feeding on mollusks, crustacea, insects, worms, &c., "in search of which it moves its bill about in the water." It is a shy bird, difficult to approach when feeding, and when nesting is more wary than any other birds breeding with it, except perhaps the Spoonbill, flying off

at once, and keeping well out of range as it careers round and round the tank. When it gets on the wing at first it flies with very rapid strokes, making a whizzing noise; but when well up in the air it settles down at a steady pace into a straight-on-end flight.

Nidification.—Several pairs of these Ibises were frequenting the breeding-place already noticed at Uduwila tank near Tissa Maha Rama; but their nests were on trees growing in the water, and inaccessible, and consequently I was unable to procure their eggs or young. The time of my visit was the 25th of March; and as most birds then had young, I conclude the same was the case with the present species, so that the time of commencing to breed in that part of the island would be about the end of January. In the North-western Province it commences earlier. Mr. Parker writes me, concerning a large breeding-colony which he visited in December 1878, that this species had young on the 31st of that month. I append the following extract of his account of his visit to the colony:—"Having received intimation that some men had discovered a breeding-place of the Waders of the district (one of those places crowded with nests and birds, of which one so often reads an account), I determined on visiting it. It was only half a mile away and we were soon there. It was at the high side of the Nikaweratiya tank, and a great mass of thorny trees effectually concealed it. We crawled under these for some distance, and then began to enter the water of the tank. As this slowly became deeper we emerged into an open space of three or four acres interspersed with a few partly-submerged bushes and trees. On all these were crowds of birds; White Ibises by dozens were close to us on the right, and many White Storks (? *Tantalus leucocephalus*) on the left, while Lesser Cormorants and Lesser Egrets seemed to occupy all the remaining space in the trees. Under one of these was a large crocodile on the look-out for any stray youngsters that might be unwary enough to fall into the water. Overhead circled a fine White-tailed Eagle, a few Kites, and, far above all, two Darters, looking like gnats in the clear blue. Then what a cawing and squawking and screaming there was when we were seen! Birds seemed mixed up in hopeless confusion; but eventually most of them settled down on trees near at hand. In about ten trees or bushes, most of them not more than 15 or 20 feet high, were crowds of nests—unshapely masses of sticks, on many of which might be seen young birds sitting or walking about. In the trees on our right, frequented by the Ibises, the nests were laid along some of the branches so closely that the young simply stepped from one nest into the next at pleasure, and the whole seemed to be common property. On one branch the centres of the nests (mere slight depressions in the beds of sticks) could not have been more than 18 inches apart. It was far from an easy matter to catch the young Ibises. They climbed about almost like Parrots, hooking their bills onto branches, or even taking hold with them, and thus drawing themselves up, whilst their little black legs kicked about in the air as they wriggled their necks further over, and presented a most ridiculous appearance.

"Without exception the nests of these birds contained three eggs or three young ones, and I presume these are the invariable number. The ages in different nests varied from fresh eggs to the almost full-grown young; and I should consider that the breeding lasts from the middle of November until the middle of February." Two eggs sent me by Mr. Parker are dull white and somewhat rough in texture; in shape they are elongated ovals, slightly broader at one end than the other, and measure 2·7 by 1·7 and 2·45 by 1·6 inches respectively. The majority of specimens, writes Mr. Hume, are free from spots; but some are delicately marked with reddish brown; and of this sort Layard procured specimens in Ceylon, as he describes the eggs as chalky white, sparingly blotched here and there with dry blood-coloured marks, thickest at the obtuse end. Indian eggs vary from 2·1 to 2·82 inches in length, and from 1·5 to 1·82 in breadth (*Hume*).

Genus PLEGADIS.

Bill much slenderer than in the last, and far less stout at the base; nostrils placed nearer the base. Wing with 1st primary nearly as long as the 2nd, which is the longest. Legs longer than in *Ibis*, slenderer. Tarsus covered in front with broad transverse scales, reticulate behind. Toes long and slender.

Head and neck feathered; the anterior portion of the face nude.

PLEGADIS FALCINELLUS.

(THE GLOSSY IBIS.)

Tantalus falcinellus, Linn. Syst. Nat. i. p. 241 (1766).

Numenius igneus, S. G. Gmel. Reise d. Russl. i. p. 166 (1770).

Plegadis (*Ibis falcinellus*, L.), Kaup, Natürl. Syst. p. 82 (1829).

Falcinellus igneus (Gmel.), Gould, B. of Austr. vi. pl. 47 (1848); Blyth, Cat. B. Mus. A. S. B. p. 274 (1849); Jerdon, B. of Ind. iii. p. 770 (1864); Holdsw. P. Z. S. 1872, p. 479; Legge, Ibis, 1875, p. 404; Salvadori, Ucc. di Born. p. 360 (1874); Elliot, P. Z. S. 1877, p. 503; Hume, Nests and Eggs, iii. p. 635 (1875), et Str. Feath. 1879 (List Ind. B.), p. 114.

Ibis falcinellus (Temm.), *apud* Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 115; Heuglin, Ois. N.Ost-Afr. ii. p. 1132 (1873); David & Oust. Ois. de la Chine, p. 433 (1877).

Plegadis falcinellus (Linn.), Dresser, B. of Eur. pt. 71, 72 (1878).

Courlis vert, Buff.; *Bay-green and Glossy Ibis*, Lath.; *Black Curlew* of Europeans. *Herez*, Arabic (Heuglin); *Swartz-whelp*, lit. "Black Curlew," Dutch; *Prater whelp*, Portuguese in Ceylon; *Kewari*, Hind.; *Kowar* in Purneah; *Tati kankaram*, Telugu; *Karapu kotan*, lit. "Black Snipe," Ceylonese Tamils.

Rattu-datuduwa, lit. "Black Sickle-bill," Sinhalese.

Adult female (Ceylon). Length 24·75 inches; wing 11·5; tail 4·0; tarsus 4·5; bare tibia 2·0; middle toe 1·6, its claw (straight) 0·7; hind toe 1·0; bill to gape (straight) 5·6.—*Adults.* (Greece, Brit. Mus.) Wing 10·4 to 11·75; tarsus 3·8 to 4·3; bill to gape 4·5 to 5·2. (India) Length 22·0; wing 10·75; tarsus 4·0; bill at front 6·0 (*Jerdon*). Mr. Elliot's measurements (*loc. cit.*) are:—Length 25·0; wing 12·0; tail 4·75; tarsus 4·25; bill along culmen 6·0. Males are the larger of the sexes; but apparently considerable individual difference in size exists.

Iris brown, in some mottled with grey; bill dark livid brown; facial skin livid, extending round the eye from the centre of the forehead and thence to the sides of the lower mandible; legs and feet bronzed brown, bluish above the knee.

Female (Ceylon). Head and cheeks metallic green, with purplish-bronze reflections; entire neck and upper part of interscapular region, as also the under surface to the vent, maroon-red; least wing-coverts and upper scapulars shining maroon-red; back, upper tail-coverts, scapulars, and wing-coverts brilliantly glossed with amethystine or purple-bronze colour, the green being most vivid on the rump and outer wing-coverts; tail green-brown, glossed with amethystine; primary-coverts, primaries, and secondaries dark green, with bluish reflections; under tail-coverts dusky green, glossed with purple; axillaries brownish green, glossed with purple; under wing dark glossy green.

Young, nestling in down. "Covered with rather short, close, black down, with a broad white band over the crown; legs and bill yellowish, the latter black at the base and tip, and with a central black band." (*Dresser.*)

Nestling plumaged, but unable to fly (Ceylon). Bill dusky, with two bands of reddish white, one near the base and the other at the middle. Plumage entirely brown, with a faint lustre on the wings; no band over the crown.

Immature (Celebes). Tarsus 3·7 inches; bill to gape 5·0. Head and neck unglossed brown; the feathers with white terminal edges, imparting a striated appearance; back and wings brownish black, glossed with green; under surface earthy brown.

Obs. It is noteworthy that there are three closely allied species of Glossy Ibis in America, differing chiefly from the present bird in not having green heads, this part of the plumage, together with the neck, being purplish chestnut in two and dark rufous-brown in another. They are:—*P. guarauna*, Linn., *Hab.* Chili and Buenos Ayres; *P. ridgwayi*, Allen, *Hab.* Lake Titicaca; *P. thalassinus*, Ridgway, *Hab.* California to Chili.

With regard to the name employed for this Ibis, I have followed Mr. Dresser in adopting a genus of Kaup's, which is the oldest applicable to the species. The generic name of *Falcinellus* appears never to have been applied to this bird by the older authors; and if it had been it could not be made use of, as this title is the oldest specific one, and should be used therefore in that sense.

Distribution.—This species, like the other members of its family, is an inhabitant of the tank-districts of the island, but is also found sometimes in tolerable abundance in the extreme north. It is well known to the Dutch and Portuguese inhabitants of Jaffna, for it is frequently seen on the tidal flats near the town and at the mouth of the Lake. It frequents the shores of many of the larger tanks, such as Minery, Kanthelai, and other similar sheets of water, and in the breeding-season withdraws to more secluded localities. On the eastern side of the island, as well as in the north and north-west, it affects the shores of salt lagoons and extensive estuaries, and in the Hambantota district is found about the leways, as also in the vicinity of jungle-begirt tanks. In the North-western Province it is met with here and there, but, as elsewhere, not numerously, owing to the fact of its being merely a resident species, and not one whose numbers are augmented by migratory flocks in the cold season from India. What migrants do come to Ceylon probably scatter themselves round the north coast as far as Mullaittivu on the east, and perhaps Puttalam on the west.

In India it is an abundant bird in some parts during the cold season, but does not seem to breed anywhere but in Sindh, in which province, as well as in the circumjacent parts of the country, it is very numerous about inland waters. The Sambhur-Lake district, however, is an exception, as Mr. Adam has not met with it there. In the Peninsula it does not appear to be at all common, as I observe that Messrs. Davidson and Wenden record the occurrence of but one specimen in the Deccan, and that Mr. Fairbank did not meet with it at all. In Chota Nagpur it is rare, occurring nowhere commonly except in Rajmehal near the Ganges. About Calcutta it is only occasionally seen, and in Furreedpore is met with in small parties in the rains. Further east it is recorded from Pegu by Messrs. Oates and Feilden, but does not appear to be a regular visitor. In Tenasserim it has not been noticed, nor is it mentioned in Mr. Hume's list of the birds of the Malay peninsula. To the east, however, it occurs in Cochin Chin, and is also found, according to Swinhoe, in China proper, about lakes at Ningpo and Shanghai. Père David, however, doubts the authenticity of the information on which that naturalist admitted the species into the Chinese avifauna. Turning southward I find that it is recorded from many of the Malay islands, including Sumatra, Java, Borneo, Celebes, Ceram, and New Guinea; whilst in Australia it has been found all along the northern coasts and down the eastern side of the continent to Victoria, extending thence to the colony of South Australia.

Returning to Western Asia we find it in Persia and on the Caspian, where it is common. In Palestine, however, it is rare, and also in Asia Minor. A bird of passage to Europe, it is plentiful in some of the more southern countries, and a straggler very far north, having occurred not only on the Faroes, but also in Iceland, though it has never yet been met with in Greenland. On its way north, and more frequently returning in the autumn, it has often visited England, and was formerly said to be tolerably common as a migrant in Norfolk. In Ireland it has also occurred, as also in Scotland. It is a straggler to Norway, Sweden, and Finland, and visits in the same manner parts of Germany and Poland; whilst in Eastern Siberia it is not at

all rare. It has been met with, according to Collin, on several occasions in Denmark. In the western countries of Europe it is equally an accidental visitor, having been rarely seen in Holland, Belgium, and France; further south it becomes common. Mr. Saunders says that it is abundant in the marismas of Southern Spain, and Professor Bocage records it as common in Portugal. Col. Irby saw great flocks at the lakes of Ras Dowra at the end of April, and met with them in Andalucia, and says that they breed near Vejer and in the marismas of the Guadalquivir. Near Gibraltar he only noticed it in April and May on passage north; he has seen eggs from Morocco, and quotes Favier to the effect that the bird occurs in Tangier on passage, returning to pass the winter further north; but some remain to breed, occurring in May, June, and July. In May it was seen in flocks in the Balearic Islands by Von Homeyer. Mr. Brooke says it occurs "not uncommonly" in Sardinia during winter; and in Malta Mr. Wright says it is a pretty regular visitor in spring and autumn. Returning, however, to Africa, we find Canon Tristram meeting with it at Tuggurt, and Mr. Salvin at Zana to the north of the Sahara. Captain Shelley says it ranges through Egypt and Nubia, being found, but not abundantly, throughout the year. Von Henglin met with it in pairs and flocks, both in spring and in autumn and winter, in Egypt, Nubia, Kordofan, and Abyssinia; he met with stragglers in July and August near Quenah and Keren, and saw young birds near Berber, as also old ones at the Tana Lake in Abyssinia; but, notwithstanding these instances, he is not of opinion that it is stationary in the region in question.

As regards America, Mr. Dresser writes that its range is not well defined, and quotes Dr. Coues, who mentions a specimen having been procured in 1817 near New Jersey, and writes:—"Since that time it has been found at irregular intervals along our coast, chiefly in the southern and middle districts, but occasionally as far north as Massachusetts, where, however, its occurrence must be considered as accidental." It has been obtained in Connecticut; and Mr. Dresser procured it in Texas, and at Matamoras in Mexico. He states that it is not certain how far south it extends, as it is there replaced by an allied species, *P. ridwayi*, Allen, which has the underparts dark, which has been found in Peru, Chili, and Buenos Ayres, and has been confused with the present. The present bird has, however, been seen in Cuba.

Habits.—This widely distributed Ibis is not only sociable but highly gregarious in its nature; it is seldom seen in less than flocks of half a dozen or more, and frequently in the cool season vast flocks assemble together and patrol the edges of tanks, large swamps, and tidal rivers, or overrun the muddy foreshores of shallow bays at low water. It is usually in Ceylon a very shy bird, and has been also noticed to be wary in most other parts of the world. In India, however, it is spoken of by more than one observer as the reverse of shy. Mr. Hume remarks that in Sindh "it was excessively tame, and sat on the trees and bushes overhanging the water, or fed fearlessly in amongst the rush and reeds till the boats were within 20 yards of it." Its diet is varied, consisting in marshy lands of frogs, worms, crustacea, mollusks, and various water insects; and in plains, to which it has a partiality, of beetles, scorpions, and locusts, on the latter of which, according to Von Henglin, it exclusively feeds on the savannas of Kordofan. The Glossy Ibis is a graceful bird when walking on the ground; the body is held moderately erect, the neck inclined forward, and the tips of the bill pointed downwards. It flies with a quick motion of the wings, and when in a flock its members keep close together and progress with a straight-on-end course. I have not heard its note, but Jerdon states that it is a loud call uttered when on the wing or when alarmed.

Nidification.—In March 1872 I found a small colony of these Ibises, numbering about eight pairs, nesting at Uduwila, near Tissa Maha Rama. The nests were placed on thorny trees growing in the half-dried bed of the small tank already referred to in former articles, and the trees chosen were those on which the Shell-Ibises were nesting. The nests were small and mostly made of twigs and grass-roots, almost flat in shape and placed upon the horizontal forks of small branches high up in the trees. The young were fledged, but unable to fly, and when I approached the trees stood up in the nests, scrambling along the branches and climbing actively about them as I mounted to the nests; when seized they clung tightly with their feet, and were with difficulty removed. My efforts to keep them alive were not successful, for while several Pelicans and Pelican-Ibises thrived on fish and meat, the Glossy Ibises died, only living two days. When flying away from their nests the old birds made a whizzing sound with their wings.

This species has been recently discovered breeding in Sindh by Mr. Doig, C.E., who found their nests in trees along the banks of large lakes bordering the Narra river. He describes the nests as about the size of those of the Darter, and made of sticks on the tops of Kundy-trees. The eggs were three in number, ovals, pointed at both ends, and of a beautiful green colour, roughly pitted over with slight indentations, giving the shell a rough appearance. They varied in length from 1·8 to 2·15, and in breadth from 1·3 to 1·55 inch.

HERODIONES.

Fam. CICONIIDÆ.

Bill stout, long, and straight, the gape not angulated, and the gonys very long. Wings long and pointed. Tail short. Legs very long; tibia naked for more than the length of the middle toe; tarsus reticulate. Toes moderately long, webbed at the base, most deeply between the outer and middle toe; claws straight and short.

Of very large size. Sternum with a single notch, pointed at the apex.

Genus LEPTOPTILUS.

Bill enormous, high at the base, gradually compressed thence to the tip; culmen quite straight; gonys almost imperceptible; tip of the lower mandible gently curved upwards; nostrils linear, placed near the culmen, with a shallow groove running parallel to it towards the tip, which is notched. Wing lengthened, with the 3rd and 4th quills the longest, and the 1st considerably shorter than the 2nd; tertials lengthened. Tail even at the tip. Tibia and tarsi covered with reticulate scales.

Skull completely bare; neck devoid of feathers.

LEPTOPTILUS JAVANICUS.

(THE HAIR-CRESTED STORK.)

Ciconia javanica, Horsf. Trans. Linn. Soc. 1821, xiii. p. 188.

Leptoptilus javanica (Horsf.), Blyth, Cat. B. Mus. A. S. B. p. 277 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 114; Jerdon, B. of Ind. iii. p. 732; Holdsw. P. Z. S. 1872, p. 477; Salvadori, Uccelli di Born. p. 358 (1874); David & Oustalet, Ois. de la Chine, p. 449 (1877); Hume, Str. Feath. 1878, p. 469 (B. of Tenass.), et 1879, p. 114 (List B. of Ind.); Sharpe, Ibis, 1879, p. 272.

The Javan Adjutant, The Lesser or *Small Adjutant*, Europeans; *Marabou Crane*, Europeans in Ceylon. *Chinjara*, Hind.; *Madan-chur, Modun-tiki*, Beng. (Jerdon); *Tontsap*, Arakan (Blyth); *Bangu* (Java); *Burong Kambing, Burong Gaja*, Sumatra (Raffles); *Hoang*, Chinese in Hainan.

Māna, Sinhalese and Tamils in Ceylon.

Adult female. (Ceylon) Length 45·0 inches; wing 24·0; tail 9·5; tibia (bare) 7·0; tarsus 9·0; middle toe 4·5, its claw (straight) 0·5; bill to gape 10·0, at front 9·8. (India) Length 48·0 inches; wing 26·0; tail 10·0 to 11·0; tarsus 9·5; middle toe 4·5; bill to gape 10·0 (*Jerdon*). (China) Length 42·0 inches; wing 24·0; tail 12·5; tarsus 8·6; bill at front 8·3 (*David & Oustalet*).

Female (Ceylon). Iris greenish white, with a brown inner circle; bill brownish grey, culmen reddish at the base; legs and feet cinereous brown; edges of scales whitish; skull, which is bare, whity brown.

Neck devoid of feathers, the region above the ears, occiput, and nape scantily clothed with greyish down, mingled with long reddish-brown hairs, forming a crest on the nape about 4½ inches in length; the same down and hairy covering is distributed over the neck to within an inch or so of its lower part, which portion is quite bare; entire under surface and the feathers round the lower part of the back of the neck white, some of the latter tipped with blackish; interscapulary region, centre of lower back and rump (where the white of the flanks encroaches), tail, and entire wings deep glossy blackish green, the feathers of the interscapulary region and wing-coverts with dark margins and cross-rays, the longer scapulars and tertials with handsome broad white margins, blending into the green; the scapulars and quills, chiefly on the outer webs, strongly glossed with purple; under tail-coverts white, the feathers long and decomposed, with the barbs curled and furnished with a fluffy supplementary appendage, which wears off to a great extent when the feathers are abraded.

Young. I have no information concerning the young of this species.

Obs. The large ally of this Stork, *L. argala*, the celebrated Adjutant of India, is furnished with a long, pendent, and pointed pouch, in which it stores away the surplus food that it may have caught. This unsightly appendage, which adds to the ugly appearance of the bird, is from 1 foot to 15 inches in length. The upper plumage is black, tinged with ashy; the white feathers round the lower part of the neck form a couspicuous ruff; the greater coverts grey, forming a wing-band; whole head, neck, and pouch quite bare. Wing about 30 inches. This species is very abundant in Bengal and parts of Burmah.

Distribution.—The so-called "Marabou Crane" is an inhabitant of the hot and dry districts of Ceylon, being sparingly distributed throughout the northern forests from Kurunegala and Puttalam to Jaffna, and down the east side of the island to the neighbourhood of Tangalla. In the moist districts of the south and in the Western Province it is not found. I have met with it in the Trincomalie district, near Tiriyeyi (Tirrai), Tamblegam, Kanthelai, and Topoor tank. Mr. Holdsworth has seen it near Aripu; and Layard met with it at various tanks in the Vanni. Mr. Parker informs me that it is found occasionally throughout the year in the North-western Province; it is fairly common in the dry south-eastern district, where Mr. Bligh has procured specimens, and frequently met with them by the lonely water-holes which stud the thick jungle of that part of

the island. It is, however, nowhere abundant, and in the breeding-season, I imagine, retires to the wildest and most unfrequented tanks to breed. Notwithstanding, it is quite possible that its numbers are increased during the north-east monsoon by sundry arrivals from India.

In the peninsula of India it is not a very common bird. Jerdon writes of its general distribution as follows:—"This species of Adjutant is found in small numbers throughout India, frequenting marshes, inundated paddy-fields, and the edges of lakes and rivers. It prefers a wooded country; and in the south of India I have only seen it on the Malabar coast. It is rare in Central India and the Upper Provinces, is now and then found in Lower Bengal, and more common in Assam, Sylhet, and Burmah." In the Deccan Messrs. Davidson and Wenden say that it occurs during the rains about marshy tanks on the outskirts of the Nulwar jungles. In Chota Nagpur Mr. Ball has met with it in Manbhum, Sirguja, Sambalpur, Lohardugga, and Jaipur. Mr. Hume has occasionally seen it at Calcutta. I do not, however, find Mr. Cripps noticing it in his list of Furreedpore birds, nor Mr. Inglis in his Cachar list. In both Upper and Lower Pegu, however, it is common, and Jerdon, as quoted above, asserts that it inhabits Assam. Vast assemblies of both species visit Pegu to breed; and so abundant are they that Mr. Oates has counted more than two hundred in a small pool of three acres. Southward, in Tenasserim it is very sparingly distributed throughout the central and southern portions of the province, the majority being probably seasonal visitants, from October to April (*Hume*). Mr. Davison has seen them most abundantly about Moulmein and Thatone, where they breed on masses of limestone rocks. It extends probably through all the Malay peninsula, although we only know of its occurrence as yet in Malacca. It has been obtained in Sumatra, being included in Sir Stamford Raffles's list of the birds of that island; and in Java it was procured by Horsfield, and first described by him from his specimens. Salvadori records it from Sarawak, in Borneo; and recently Mr. Low has obtained it in the province of Lumbidan. Going northward now, we find it in Hainan in marshes, in the centre of which island Mr. Swinhoe met with it; Père David likewise records it from Cochin China, and met with it in Kiangse in the month of July.

Habits.—Unlike the larger Adjutant, this bird, instead of frequenting towns and villages, and performing the duties of a useful though very unsightly scavenger, shuns the society of man, and frequents jungle and forest-country, affecting lonely marshes, tanks, swamps, banks of rivers, and even small water-holes in the depths of wild and unfrequented jungle. In Ceylon it is almost exclusively found about the latter localities and small tanks in the very remotest recesses of the northern and eastern forests. It is often seen in small parties of three or four, but more frequently is encountered singly, and when disturbed usually flies to the top of a tall tree on the outskirts of the jungle, where it remains until from its elevated position it sees that the field is clear, when it descends again to its fishing-grounds. While thus perched its neck is outstretched and head elevated, its attitude being one of watchfulness; but when standing on the ground or walking in water the neck is entirely drawn in, and the nape actually rests against the shoulders, from which position, however, the head is shot instantaneously out when it catches sight of its prey. I have observed that in a state of captivity the mandibles are scraped together with a quick lateral motion, this action being performed when the bird expects to be fed. When reposing it squats on the hind part of the tarsus, with the toes stretched out. Its diet is miscellaneous as regards animal food, and large insects, such as locusts, are also devoured by it. In the stomach of an example I shot in the Trincomalie district I found the remains of frogs, crabs, fish, and a small mammal, probably a rat. In conjunction with its larger ally and Pelicans it is said to create tremendous havoc among fish in Burmah when the tanks are drying up. This Stork, like its relation, the Pouched Adjutant, is a very silent bird; the latter during the breeding-season makes a noise like the "low of a buffalo," or a cow which has been robbed of its calf; and most probably the note of our species is similar.

Jerdon remarks that "its Bengalee name *Modun-tiki* is applied to it ironically, from its ugly head and neck, the expression meaning that the hair of its head is as beautiful as Modun, one of the sons of Krishna."

Nidification.—It is somewhat noteworthy that as yet the Adjutant has not been found breeding in Ceylon. If, as Mr. Parker informs me, it is resident in the northern forests, it must needs breed somewhere, and being such a large bird it is singular that some "colony" has not been discovered. It may after all be only migratory; but against this hypothesis we must set the fact that at the time of its visiting Ceylon it is

breeding in large numbers in Burmah. In this latter country both species arrive suddenly in vast numbers in October, and commence breeding in the following month. On a range of limestone rocks called the Needong hills, which rise perpendicularly from the forests on the Attaran river, Mr. C. T. Bingham found a large colony of both species, the nests being placed on ledges of the rock, and were large flat masses of sticks without any lining. Unfortunately no eggs of the present species were procured, those taken belonging to the Pouched Adjutant. Mr. Oates has recently recorded the finding of an enormous colony of Adjutants and Pelicans extending over a large forest on the left bank of the Sittang, between Rangoon and Tonghoo. The nests were wedged into the forks of the branches of immense trees, and were so large that a sitting bird could not be seen from below. Some eggs brought to Mr. Oates by a native as those of the Hair-crested Stork were snow-white, with the interior lining of the shell dark green; but as they measured more than those of the Pouched Adjutant, it is probable that they belonged to the latter bird. The dimensions of two were 3·16 by 2·25 and 2·98 by 2·2 inches.

A pair of eggs sent by Mr. Low from Lumbidan, Borneo, together with the head of the female bird, to Mr. Sharpe, are pale greenish blue, measuring 2·7 by 1·95 inch.

Genus XENORHYNCHUS.

Bill very large; culmen and commissure slightly ascending near the tip. Legs longer than in the last genus.

Head and neck feathered closely.

XENORHYNCHUS ASIATICUS.

(THE BLACK-NECKED STORK.)

Mycteria asiatica, Lath. Ind. Orn. ii. p. 670 (1790), adult.

Ardea indica, Lath. Ind. Orn. ii. p. 701 (1790), immature.

Mycteria australis (Shaw), Gould, B. of Austr. vi. pl. 51 (1848); Blyth, Cat. B. Mus. A. S. B. p. 276 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 114; Jerdon, B. of Ind. iii. p. 734 (1864); Holdsw. P. Z. S. 1872, p. 477.

Mycteria indica (Lath.), Hume, Nests and Eggs, iii. p. 607 (1875).

Xenorhynchus asiaticus (Lath.), Hume, Str. Feath. 1878 (B. of Tenass.), p. 469, et 1879, p. 44 (List B. of Ind.).

Indian Jabiru, Lath. Syn. Suppl. p. 231; *Loharjung Heron*, Lath. (immature); *Indian Jabiru* of some. *Banaras, Loharjung*, Hind.; *Ram salik*, Bengal (Jerdon); *Peria koku*, Ceylonese Tamils, lit. "Large Heron."

Al-koka, lit. "Man-Heron," from its size, Sinhalese (Layard).

Adult (India: B. Mus.). Wing 25·0 inches; tail 10·0; bare tibia 7·0; tarsus 11·8; middle toe 4·3; bill at front 12·0.
Male (Pegu). Length 52·4 inches; wing 22·0; tail 9·4; tarsus 12·7; bill from gape 11·9; expanse 85·0 (*Oates*).
Male (Australia: Phil. Mus.). Wing 19·5 inches; tarsus 12·0; bill at front 12·0.

"Iris bluish brown; bill black, gular skin dusky purple; eyelids dusky purple, turning to pink at the centre of the lower lid; legs and feet coral-red, claws dusky pink." (*Oates.*)

Adult (B. Mus.). Head and neck glossy green-black: the crown, occiput, and nape purple, the whole illumined with a strong metallic sheen; greater wing-coverts, tertials, scapulars, and tail green-black, highly glossed; some of the underlying tertials white, the upper scapulars washed with greyish; all the rest of the plumage pure white.

Immature (Ceylon, June 1875). Wing 23·2 inches; bill at front 10·1, height at anterior edge of nostril 1·9.

Female (Sambhur). Length 52·8 inches; wing 24·0; tail 9·6; tarsus 13·5; bill at front 11·5.
Iris brown; bill black.

(India: B. Mus.) Head and neck greyish brown, blending into the white of the chest; upper back, lesser and median wing-coverts glossy hair-brown; lower back and rump white, washed with brown; quills black, glossed with green; tail whitish at the base, terminal half black; edges of the neck-feathers greyish white.

An example killed in June in Ceylon is in a phase of plumage between the above and the adult dress. Head dark brown, glossed with green; the wing-coverts are greenish black, tipped pale, the lesser series and point of the wing brown, edged with fulvous; primaries white at the base and brown on the terminal portions, the white increasing from the first quill, which is almost entirely brown, to the innermost, the four inner feathers being only tipped with brown; secondaries with the outer webs and tips greenish brown, mingled with whitish.

Obs. Owing to a mistake made by Gould in describing the Australian Jabiru, and Gray probably following him, the latter bird has been considered distinct from the Indian. Gould described the "lower part of the back" as being "rich glossy green," whereas it is white, and exactly the same as in the Indian bird. I have been kindly favoured by the Secretary of the Academy of Natural Sciences of Philadelphia, in answer to my queries on the subject, with a description of Gould's bird, which is preserved in the Museum of that institution. It runs as follows:—"The tail is dark green, but the *whole of the back*" (italics not mine), *the rump, and tail-coverts are pure white*; the dark green scapulars lie across the back, and it at first looks as though the lower part of the back was really dark green." It will be seen, therefore, that there is no difference between the two forms; it is noteworthy, however, that the wing-dimension sent me from Philadelphia is inferior to that of Indian birds; but this is, no doubt, an individual peculiarity. The American Jabirus (restricted *Mycteria*) have the head and neck bare.

Distribution.—This enormous bird is occasionally met with in Ceylon during both the monsoons of the year, which favours the belief that it must be a resident in the island, although its rarity points to the supposition that it is a straggler from India. Layard's experience of it is thus summed up :—" I have only," he says, " seen a few of these huge waders in the Jaffna estuary at Elephant Pass." I have myself heard of its having been seen in some marshes between Batapala and the Bentota river, about 15 miles inland from Amblangoda, but in all my wanderings have only twice met with it myself—once in January 1873 on the Peria-kerretje salt lagoon, and again in July 1875 at Minery lake, on which occasions I saw single birds. In June 1875 the immature specimen above noticed was shot at Vellai plains by a native accompanying Mr. H. Varian, of the Public Works Department, on a trip to that locality. This gentleman has more than once met with it in remote forest wilds; and recently Mr. Bligh writes me of an individual which he unsuccessfully stalked at a lagoon near Yāla.

Jerdon states that it is found throughout India, being rare in the south of the Peninsula and more common in Central India and Lower Bengal; but Mr. Hume writes that it breeds pretty well all over the empire in well-watered tracts, where large lakes, jheels, and swamps are common, but is nowhere numerically abundant. The only mention of its occurrence in the Deccan that I find in 'Stray Feathers' is the supposition of Mr. Davidson that he has seen it there. Mr. Ball has only met with it in Sirguja, Lohardugga, and on the southern borders of Raipur, and above Calcutta it is only occasionally met with. In Guzerat, at the opposite side of the empire, it is not uncommon in suitable localities, as is likewise the case in Kutch and Kattiawar. In Sindh Mr. Hume seldom saw it; but higher up the Indus in the Punjab he more frequently met with it. In the Sambhur-Lake district Mr. Adam has only twice seen it. Turning eastward, again, I find that it is resident but not common at Thayetmyo and Rangoon, according to Mr. Oates; and in Tenasserim it is very rare, having only been seen in the north of Pahpoon. It extends down the peninsula of Malacca in all probability; for it is recorded from various parts of the Malay archipelago, being common in the Aru Islands, and has lately been recorded by D'Albertis from New Guinea. In Australia it has a wide range, according to Gould, being, however, most abundant on the northern and eastern shores; but even about Moreton Bay and the Clarence River it used to be common. Mr. Gilbert met with it at Port Essington and also in the interior. Recently, in his list of Australian birds, Mr. Ramsay notes it from Pt. Darwin, Gulf of Carpentaria, Cape York, Rockingham Bay, and other places down the east coast to New South Wales.

Habits.—This Stork is not by any means a gregarious bird, being usually seen singly or in pairs. It is partial to salt-water lagoons with shallow foreshores, in which it wades far out from the edge of the water, its length of leg giving it great powers of exploration, and enabling it to keep so much in the open that it is with difficulty approached. The lonely lagoons which are to be found all round the east coast of Ceylon, surrounded by Elephant-jungle, and seldom visited by Europeans, are just the spots for this wary giant among Storks. When disturbed it flies off with slow and heavy flaps of its pinions, and after acquiring sufficient impetus sails lazily on with outstretched wings to a place of safety. It feeds on fish, frogs, reptiles, crabs, and even mollusks, according to Jerdon, who likewise states that a very good *Bhyri* (Peregrine) will strike down this Stork.

Nidification.—Having no record of the nesting of the Black-necked Stork in Ceylon, I append the following extract from Mr. Hume's 'Nests and Eggs':—" It lays, the time varying a good deal according to season, from the beginning of September to the middle of December, and Mr. Horne took hard-set eggs as late as the 27th of the latter month.

" They build upon large trees, very commonly on large Peepul trees; but I have found the nests on Sheeshum, Semul, and many other kinds. The nest, always a great platform of sticks, is sometimes enormous; one I found near Badlee was fully 6 feet long by 3 feet broad, and so deep that three fully-fledged young ones just able to fly were able to crouch in it, so as to be invisible even when the nest was looked at from some distance with binoculars. Usually the nest is from 3 to $3\frac{1}{2}$ feet in diameter, and with a considerable cavity, not so flat as a Vulture's, but with a deep saucer-shaped depression. It is carefully lined with rushes, grass, pieces of 'ban' or grass-rope, water-weeds, &c. One nest that I examined had a regular parapet of mud (the kind of clay we call '*chiknee muttee*') all round the margin of the cavity, some 3 inches wide and 2 inches

high; and Mr. F. R. Blewitt, who watched the birds building this nest, told me that the birds took more than a month building it, taking immense pains to finish it off. When it was nearly ready, they put a sort of rim of clay all round the top of it; the old birds descended alternately to the tank and brought up the mud in their bills, and then standing on the nest, they seemed to manipulate and arrange it with the greatest care with their long bills. These also hatched off three young." He remarks, however, that this was an exceptional nest, as he never saw another like it. Four is the usual number of eggs, but sometimes five are laid. They very often, he says, use the same nest year after year, but very commonly they build a new one.

Mr. Hume further adds:—"These birds have a most remarkable method of paying delicate attentions, or, it may be, merely of dancing. A pair will gravely stalk up to each other, and, when about a yard or two feet apart, will stand face to face, extend their long black-and-white wings, and while they flutter these very rapidly, so that the points of the wings of the one flap against the points of the other's wings, advance their heads till they nearly meet, and both simultaneously clatter their bills like a couple of watchman's rattles. This display lasts for nearly a minute, after which one walks a little apart, to be followed after a moment by the other, when they repeat the amusement, and so on for perhaps a dozen times."

Genus DISSURA.

Much as in *Ciconia*, but with the neck-feathers soft or fluffy, and the upper tail-coverts furcate, very stiff, the exterior feathers reaching to the tip of the tail. Forehead and face small.

DISSURA EPISCOPA.

(THE WHITE-NECKED STORK.)

Ardea episcopus, Bodd. Tabl. Pl. Enl. p. 54 (1783).
Ardea leucocephalus, Gm. Syst. Nat. i. p. 642 (1788).
Ciconia leucocephala (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 277 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 114; Jerdon, B. of Ind. iii. p. 737 (1864).
Ciconia episcopus (Bodd.), Holdsw. P. Z. S. 1872, p. 477; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1108 (1873).
Melanopelargus episcopus (Bodd.), Salvadori, Uccelli di Born. p. 356 (1874); Hume, Nests and Eggs, iii. p. 609 (1875); id. Str. Feath. 1878 (B. of Tenass.), p. 469.
Dissura episcopus (Bodd.), Hume, Str. Feath. 1879 (List B. of Ind.), p. 114.
Violet Heron, Lath.; *Beef-steak bird* in India; *Parson bird* (from its white neck), Europeans in Ceylon. *Manik jor*, Hind., also *Rali, Sanku buda konga*, Telugu; *Saudang-lawe*, Java (Horsf.); *Māna koku, Vanatay koku* in Manaar.
Padre-koka, lit. "Parson bird," Sinhalese.

Adult male and female (Ceylon). Length 32·0 to 32·5 inches; wing 18·0 to 18·5; tail 7·0 to 7·5; bare tibia 4·0; tarsus 6·0 to 6·5; middle toe 3·3 to 3·5; hind toe 1·2; expanse 67·0; bill to gape 5·8 to 5·9, at front 5·5.—*Male and female* (Nepal). Length 35·3 to 37·0 inches; wing 19·6 to 20·5; tail 7·6 to 8·2; tarsus 6·7 to 7·0; bill from gape 6·1 to 6·9; weight 4 lb. 8 oz. to 6 lb. 1 oz.; expanse 70·0 to 74·0 (*Scully*).—*Male* (Pegu). Length 36·0 inches; wing 20·6; tail 8·0; tarsus 6·9; bill from gape 6·8 (*Oates*).

Iris scarlet, with a yellow disk in the sclerotic or space surrounding the iris; bill black, changing to red at the tips of both mandibles, margins red; frontal and facial bare skin leaden; legs and feet dusky red, the edges of the webs whitish. In a specimen apparently not quite adult the iris is reddish orange, with a bluish-brown outer circle. Bare skin along the ulna vermilion-red.

Genus CICONIA.

Bill smaller than in the preceding genera, straight; culmen keeled; nostrils narrow and linear. Wings with the 2nd and 3rd quills the longest. Legs long. Toes short, flattened, bordered by a narrow membrane at the sides and webbed at the base.

CICONIA ALBA.

(THE WHITE STORK.)

Ardea ciconia, Linn. Syst. Nat. i. p. 235 (1766).
Ciconia alba, Bechst. Naturg. Deutschl. iii. p. 41 (1793); Blyth, Cat. B. Mus. A. S. B. p. 276 (1849); Jerdon, B. of Ind. iii. p. 736 (1864); Dresser, B. of Eur. pt. 19 (1873); Hume, Str. Feath. 1879, p. 114 (List B. of Ind.).
La Cigogne, Buff. Ois. viii. p. 117; *Cegonha*, Portuguese. *Lag-lag, Haji lag-lag*, Hind.

Adult female (Furreedpore). Length 51·75 inches; wing 24·0, expanse 77·5; tail 9·75; tarsus 8·5; bill from gape 7·75, at front 7·10 (*Cripps*).—*Adult* (Egypt: Brit. Mus.). Wing 23·75 inches; tail 9·5; tarsus 7·8; middle toe and claw 3·4; bill to gape 7·7, at front 6·7.—*Adult* (England: B. Mus.). Wing 24·5 inches; tail 9·0;

Head and nape black, glossed with metallic green, the feathers not extending beyond the anterior corner of the eye; upper and middle portion of the neck with the throat white, the feathers somewhat decomposed and soft; lower portion of neck and elongated plumes in front overlying the chest brilliant metallic amethystine, illumined with green when viewed against the light, the concealed parts of the feathers blackish green; back, upper tail-coverts, scapulars, and wings black, glossed with green and purple reflections; the feathers along the ulna of the same

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tarsus 7·0; middle toe 3·5; bill to gape 7·8.—*Adult* ("Europe": Brit. Mus.). Wing 21·5 inches, bill at front 6·1. There appears to be considerable variation in the length of tarsus.

Iris deep brown; bill red, dusky at the extreme tip; legs and feet pinky red, claws black; orbital skin blackish.

Plumage white, except the primaries, secondaries, primary-coverts, winglet, tertials, and longer scapulars, which are black; the primary-coverts white at the base; shafts of the primaries white at the base; plumes at the lower part of the front of the neck elongated.

Young. Bill yellowish orange, dusky in parts; gular pouch dusky in front, orange at the gape; orbital skin dusky; iris greenish brown; legs and feet pale yellowish, becoming orange in parts; claws yellowish horny (*Scully*). A young bird bred in June measured on the 24th July—wing 19·8 inches, tarsus 8·15; weight 6 lb. 0·5 oz. Plumage similar to the adult.

Distribution.—Until very recently the Stork has never been noticed in Ceylon; and up to the present time, so far as I am aware, no specimens have actually been procured in the island. I have, however, received undoubted evidence of its occurrence in the south-east of the island, where Mr. Bligh met with it near Yāla at the beginning of last year; and I accordingly include the species in the avifauna of Ceylon. At the same time I follow the rule adopted through the work, and include my notice of this bird as a footnote only. The circumstances under which Mr. Bligh met with the Stork are so peculiar that I append his account verbatim:—"I wish I could do justice," he writes, "to a scene we witnessed on returning from Udapottena, which we left at daybreak. The sun was just rising as we neared the ford across a salt lagoon; on the right was a scattered herd of spotted deer scampering off to their prickly coverts. Suddenly rounding a clump of bushes near the ford, and which had hid it from our view, we were astonished to meet within a few yards of us a huge grey Pelican, looking so comical, lazily flapping his big wings, with his head tucked in, while he was being most determinedly attacked by a beautiful White Stork (*Ciconia alba*), which was striking him on the centre of the back with its beak. The Stork was a lovely-plumaged mature bird; its brilliant red beak and legs showed to advantage in the rising sun, and with its black-and-white plumage so clearly defined it looked quite a showy bird compared with the Pelican. What caused the quarrel it is impossible to conjecture; it might be that the Pelican had been poaching on the Stork's favourite fishing-grounds, and the latter had got alarmed on seeing the intruder's mode of scooping up the fish by the score into its capacious pouch!" Subsequently to the receipt of this account, Mr. Parker informs me that he met with several Storks at the tank of Nikaweratiya, which appeared to be breeding there in company with Egrets, Herons, &c.; but I am doubtful as to the correctness of their identification, as the Stork does not breed anywhere in India; and it is possible that the Pelican-Ibis may have been mistaken for the present species, which can only be a migrant in its non-breeding season to the island.

In India the Stork is a common cold-weather visitant, being tolerably frequent in the Deccan, distributed throughout the region between there and Calcutta, near which place it occurs occasionally, as also in Furreedpore, further east; but beyond the confines of Bengal it does not extend. In the north-west of the empire it is scattered moderately throughout the various provinces in the cold weather, and was met with by Mr. Hume in tolerable numbers on the Indus. Dr. Scully found it common in the plains of Kashgharia from April to August, breeding there, and the young remaining until October. Further east it is replaced by a larger species (*C. boyciana*), very similar, but differing in the colour of its bill, which is brown with a reddish base, and in the shape of the nude orbital skin. It is found in Persia and Palestine, passing northward in April through the latter country in such vast flocks that the entire country (rocky hills, oliveyards, sandy plains, and even the dunghills in villages) is covered with them; they remain, moving north a few miles a day, till they have cleared off all the snakes, lizards, frogs, or fish, and they then disappear.

In Southern Africa it winters in abundance, being found in Cape Colony and in Damara Land, and is said by Layard, on reliable evidence, to breed in the former region. It is found on the west coast, and in the northern parts of the continent is very abundant, especially on passage northwards to Europe, in many countries of which it breeds. It nests in the Sahara, in Morocco, and Algeria; and Von Heuglin considers that it may do so in limited numbers in North-eastern

colour as the lower neck, with green reflections; breast, flanks, and axillaries brownish black, illumined at the tips of the feathers with green; under wing blackish green; abdomen, under tail-coverts, inner side of tibia, and tail pure white; under surface of quills metallic green. The curiously forked upper tail-coverts reaching laterally to the end of the tail gives this species, as Jerdon remarks, the appearance of having a double tail.

Young. An immature bird in my collection has the head brown, mixed with green feathers; the upper surface is as

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Africa. About January vast numbers of Storks pass through Morocco and over the Straits of Gibraltar, spreading over portions of Spain (in the south of which they commence to lay as early as the latter half of March), and extending northward through France to the Low countries, and eastward thence into Denmark, where it used to be very abundant prior to the draining of the extensive marshes and morasses of the country. Further north still it strays in small numbers into Norway, and perhaps more numerously into Sweden. On its way northward it has from time to time visited the British Isles, having been met with or killed in Hampshire, Wiltshire, Oxfordshire, Suffolk, Norfolk, and Yorkshire, and very rarely in Scotland, having once been shot as far north as Shetland. In the county of Norfolk it has occurred more frequently than elsewhere. Once only has it been obtained in Ireland. Eastward in Europe the migratory stream of Storks seems to be less powerful; but though they pass through Italy in small numbers, visiting the Mediterranean isles on their way over from Africa, yet they muster in considerable force in Germany. Further east again it is more numerous, migrating abundantly from Egypt into Greece, and passing northward into Southern Russia; in Northern Russia it is rare, though it occurs in the Governments of Moscow and Jaroslaf, and further west, in Poland, is very common. Finally, it occasionally happens that flocks diverge westward on their way north from Africa and visit the Canaries, but do not remain in those islands, passing on to the coast of Europe.

Habits.—This Stork is the most sociable of its family, migrating in large flocks, the members of which keep together throughout their journey and fly at an immense altitude. When a halt is made in districts where they perceive that food abounds they are very useful in clearing the country of reptiles, locusts, and small vermin, not frequenting the vicinity of water, but spreading themselves over the plains and fields, each bird keeping a little apart from its neighbour. The males arrive in European countries some days before the females, and employ their time in inspecting their old nests, which they reoccupy every year. In India and other tropical countries where they pass the winter they associate in flocks and frequent open plains. They are held sacred in Mohammedan countries, and are consequently excessively tame; Col. Irby was informed on credible authority that in some towns in Morocco there is a Stork hospital, where birds that fall from a nest, or get injured in any other way, are sent and cared for! Storks are said to utter no note. They have a habit, when under the influence of any emotion, of clattering their bills, throwing back their heads always while so doing, and violently snapping their mandibles together. In India it is often hawked, and, according to Jerdon, is a common and favourite quarry for the Peregrine. It walks in a stately manner, and is a graceful bird in the way it holds its head and in its general deportment. I have noticed that it stands much on one leg, balancing itself with marvellous steadiness. In Europe it is strictly preserved, and its annual return to the towns and villages where its nests are situated is looked for with great interest by the inhabitants, many of whom consider it a very lucky circumstance to have a Stork's nest built on their chimneys. In Denmark it is the subject of many legends and nursery tales; and the fact of a dead young one or an addled egg being often thrown out of the nest has given rise to the superstition among the peasantry that the bird throws them down to pay its rent. Storks evince great affection for one another: Brehm writes that in Egypt a male has been known to remain behind with a female which had been wounded.

Nidification.—The Stork either nests on trees or on the roofs of buildings; the former are often chosen in Africa and also in Asia; but in European towns the nests are placed nearly always on buildings. I have seen them myself in Strasburg and in Schleswig Holstein on chimneys. The nest is a very large structure of sticks, which is added to year after year until the walls become very high and the fabric so massive that occasionally part of it has to be removed during the winter to relieve the roof of the house from the weight. The old birds have been known to recognize and take possession of the nest after it had been removed during the winter to another spot. The males fight so vigorously for the possession of the females that two have been known to disable each other in these matrimonial battles. The number of eggs laid varies from three to five; they are pure white, and measure about 2·8 to 3·2 inches in length by 2·0 to 2·2 in breadth. The young are fed by the parent birds with food that has been swallowed; on alighting on the nest they throw back their heads over their shoulders, and, pointing the bill upwards, eject the food from their stomachs.

in adults, the plumage being old and abraded, showing that the head is the last to change; there are some brown feathers on the rump, which are evidently the remains of the first winter's dress.

Obs. The African bird is, according to writers, smaller than the Asiatic, as will be seen by Von Heuglin's measurements, which are given as—length 29·5 inches, wing 16·5 to 17·5, tarsus 5·18 to 5·75, bill at front 4·68 to 5·33; Layard, however, gives the wing of South-African examples as 18·5. In addition to this alleged inferiority in size, the webs of the four outer tail-feathers are black, shining, coppery, according to Layard; and if this is the plumage of the adult bird, it will require separation from the Asiatic.

Another species found in India is the Black Stork, *Ciconia* (*Melanopelargus*) *nigra*, Linn., which is entirely black, save the lower breast and abdomen, which are white. The black plumage is illumined with violet and green reflections. Length 40·0 inches, wing 20·0 to 23·0, tarsus 7·5 to 8·0, bill to gape 7·8. Iris dark brown; bill dark red; legs and feet dull red; orbital skin red. This species has occurred as a visitor in the Deccan, and may possibly stray as far south as Ceylon.

Distribution.—This handsome Stork is infinitely more numerous than the last two species, being in some parts of the island quite a common bird. It is a resident species, and confined to the northern, eastern, and south-eastern divisions of the island. These birds are liable to be found at any secluded tank in the heart of the forest, and still more so at wild jungle-begirt salt lagoons not far from the sea-shore. South of the Virgel I met with large flocks in October 1875 about salt marshes bordering creeks that ran inland some distance from the shore. In the interior I have seen them at Kanthelai, Minery, Hurullé, Kalpe, and other tanks; and in the Central Province I once met with a flock near Bibile on some elevated patnas. In the Wellaway Korale it is not uncommon; and Mr. Bligh recently met with it near Yāla. Mr. Parker records it from the Uswewa and Nikaweratiya districts, as also from Anaradhapura. Mr. Holdsworth did not meet with it near Aripu; but in the island of Manaar Mr. Simpson tells me it is often seen. I have no record of its occurrence in the Western Province or in the south-west of the island.

It is a common bird in India, more especially, says Jerdon, in well-watered districts. It is plentiful, however, in portions of the Deccan, breeding in the Sholapoor and Satara districts; throughout Chota Nagpur it is, says Mr. Ball, abundant, and is recorded by him from the Rajmehal hills, Manbhum, Lohardugga, Orissa, Nowagarh, and Karial; from Raipur likewise Mr. Hume notes it. About Calcutta it is occasionally seen, and in Furreedpore is common during the rains. Further north it is found along the base of the Himalayas, being common in the valley of Nepal from May till December, in the Nawakot district in November, and in the Terai in December (*Scully*). Going westward now through the North-west Provinces, where it must needs occur, we find it somewhat localized in the direction of the Indus. Mr. Adam notices it as a visitor in the rains to the Sambhur-Lake district; and Captain Butler says it is tolerably common in the plains of Guzerat, and also found at the lake at Mt. Aboo; but Mr. Hume has not seen it in Kutch, Kattiawar, or Sindh, nor has he heard of it from any other part of Jodhpore but the Sambhur Lake. It is not entered in Mr. Doig's list of birds breeding in the Eastern Narra, and it is therefore probable that it does not occur anywhere in Lower Sindh. Leaving India proper we find it spoken of as resorting in flocks to the plains of Pegu during the rains, and also found there in the cold weather. In the province of Tenasserim it is "sparingly distributed in suitable localities throughout the central and southern portions of the province." Mr. Davison has met with it at Amherst, Tavoy, and on the Pakchan. Southward it is found in the Malay countries, and extends to Sumatra and Java, thence to Borneo (from where Salvadori records it, and where Mr. Treacher has recently procured it on the Láwas river), and finally to Celebes, concerning which Dr. Meyer writes:—"Not rare in the Gulf of Tomini, but rarely goes as far north as Kema, where I got one specimen in May; another one I procured at the lake of Limbotto in July, and one on the Togian Islands in August."

Habits.—The White-necked Stork is partial to dry spots in the vicinity of water; for though it frequently affects the edges of tanks and rivers at times, it is more often seen in the dried-up beds of the same, or on grassy plains near salt lagoons or estuaries of rivers. In the hot season there are numbers of moderately-sized tanks in the forests of the north and east from which the water has almost entirely evaporated, leaving a rushy plain with here and there a few bare places, and near the outlet a muddy pond alive with fish and frogs; it is in such situations that the Parson bird is often found, walking staidly about the bare stretches of baked mud,

feeding on beetles, crickets, &c., or patrolling round the water-holes and capturing frogs, mud-fish, and so forth. In July I found a large flock at Hurullé tank, which roosted in a fine grove of trees at the upper end, and in the daytime frequented the grassy rushy bed of what was once, before the vast bund was broken through, in times gone by, a magnificent sheet of water. It is not by any means a shy bird, and will often suffer itself to be approached within easy gun-shot. Occasionally after being disturbed a flock will rise into the air and circle round and round at a great altitude. Their wings are for the most part kept motionless during these gyrations, but now and then a fresh impetus is given by a few powerful strokes. Mr. Ball speaks of seeing a pair of these Storks flying backwards and forwards through a rising swarm of winged Termites, upon which Rollers and King-Crows were making great havoc, and noticed them repeatedly open and close their bills, from which it may be inferred that they were catching the ants on the wing! The same writer mentions that the Black Stork is very fond of the society of this species, although of a much shier nature. The name of Beef-steak bird is applied to it on account of its flesh being palatable when cooked as steak; and its Hindoo name, *Manik jor*, means, says Jerdon, the companion of Manik, a saint, in consequence of which some Mussulmen abstain from eating it.

Nidification.—In Ceylon this Stork does not breed in company with other members of its order, nor with Pelicans &c. I have never discovered a breeding-colony, and I imagine that it nests in the very wildest parts of the jungles. Layard, however, was more fortunate; he says that it breeds on trees in company, "laying several pure white chalky eggs, the surface of which is curiously granulated." The dimensions he gives are 2·75 by 1·86 inches. In Upper India it breeds from the latter end of July to the end of August; but in the south it begins as early as March. Mr. Hume writes that "the nests are placed in large trees, Peepul (*Ficus religiosa*), Burgot (*Ficus indica*), Tamarind, and Sheeshum being the favourites. They are rarely above 20 to 30 feet from the ground, and vary from 14 to 20 inches in diameter, and from 4 to 5 inches in depth. They are densely built of twigs and small branches, and have a considerable depression, sometimes thinly lined with down and feathers, and sometimes almost filled with straw, leaves, and feathers, amongst which the eggs are sunk as if packed for travelling. The full number is four." They vary much in shape, being either long narrow ovals or broad ovals pointed towards one end. They are faint bluish white when fresh, becoming stained and soiled into a yellowish earthy brown. In size they vary from 2·3 to 2·66 inches in length and from 1·75 to 1·92 in breadth (*Hume*).

HERODIONES.

Fam. ARDEIDÆ.

Bill more slender than in the Storks, very sharp; nostrils placed at the basal extremity of a long groove; loral region bare. Only the outer and middle toe connected by a web at the base; hind toe on the same plane with the front; middle claw pectinated.

Sternum with a narrow emargination as in the last family; breast and lower flanks furnished with powdery tufts of decomposed feathers.

Genus ARDEA.

Bill long and pointed, the culmen nearly straight; the gonys well defined and one third the length of the bill from the gape; naral groove pronounced; loral region bare. Wings lengthened; the 2nd and 3rd quills subequal and longest, the 1st less than the 4th; inner webs of quills notched. Tail short. Legs very long; tibia naked far above the knee; tarsal scales broad and transverse, but angulated at the sides; toes lengthened, inner toe considerably shorter than the outer; the web between the outer and middle toe well developed; claws curved, the middle finely pectinated.

Head crested; scapulars elongated, but not "decomposed;" lower neck-feathers in front elongated.

ARDEA GOLIATH.

(THE GIANT HERON.)

Ardea goliat (Temm.*), Rüppell, Atlas Reise nördl. Afr., Vögel, pl. 26 (1826); Temm. Pl. Col. v. pl. 474, 80e livraison (1829); Blyth, Cat. B. Mus. A. S. B. p. 278 (1849); Jerdon, B. of Ind. iii. p. 739 (1864); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1048 (1873); Hume, Str. Feath. 1878, vii. p. 490, et 1879, p. 114 (List B. of Ind.).

Ardea nobilis, Blyth, Ann. & Mag. Nat. Hist. xiii. p. 175 (1844).

Riesenreiher, German; *El mireh*, Arabic.

Note. The bill is slightly curved upwards in this species.

Adult female (Kirinde, Ceylon). Length 53·0 inches; wing 22·0; tail 9·5; bare tibia 5·75; tarsus 9·0; middle toe 6·0; hind toe 5·3; bill to gape 9·0, at front 7·35: weight 10 lbs. (*Bligh*, in epist.).—*Adult.* (India, Ind. Mus.) Wing 24·0; tail 9·0; tarsus 9·5; bare tibia 5·0; middle toe 5·8; bill to gape 9·7, at front 8·1. (N.E. Africa) Length 49·32 to 52·41; wing 20·5 to 21·0; tail 8·0; bare tibia 5·0 to 5·75; tarsus 8·0 to 9·0; bill at front 6·57 to 7·42.

Adult (living, Zoological Gardens). Iris yellow, with a reddish margin; bill dark slaty, under mandible fleshy, with a dark margin; legs and feet dark slaty blackish, edges of scutes whitish; eyelid pale slaty.

(India Mus.) Head (and crest 4½ inches in length) cinnamon-reddish; forehead and lores slaty; hind neck and sides of neck paler cinnamon than the head; upper surface and wings slaty bluish; basal portion of wing-covert feathers rusty red; greater coverts tinged with reddish; primary shafts blackish; tail slaty bluish; chin and upper throat white; fore neck down the centre slaty black and white, the feathers tinged with rufous, the central feathers are white, with slaty black edges; elongated feathers of the lower neck white tinged with rufescent, with slaty brown lateral stripes; feathers of the chest, breast, and underparts dusky cinnamon-rufous, many of the feathers whitish at the edges; the tufts at the side of the chest darker than the rest; under wing dusky cinnamon-rufous, the edge whitish; thighs reddish, tipped with slaty; under tail-coverts reddish ashy.

An African specimen, now living in the Zoological Gardens, from which the description of the soft parts is taken,

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* Temminck's description (80th livraison Pl. Col.) to accompany his figure of this species (pl. 474), and at the head of which he bestowed his title of *goliat*, was not published until 1829, as will be seen by reference to the dates of publication of the different livraisons. At the end of the article he remarks that an account of another specimen is to be published ("*sera publié*") by Herr Rüppell; and this appeared, if we are to place any dependence on dates, in 1826, three years prior to Temminck's description. I conclude that the latter author communicated to Rüppell the name he had applied to the species, and that the German made use of it. Be this as it may, Rüppell's account was first published.

has the red portions of the plumage brighter than in the Indian bird above described; the under surface is almost entirely rufous, and the pectoral tufts paler-coloured, without the slate-brown stripes, being simply whitish edged with slaty.

Young: immature bird (Calcutta, Brit. Mus.; *Ardea nobilis*). Wing 21·5 inches; tail 7·5; tarsus 6·5; middle toe 4·3; hind toe 2·0; bill to gape 7·3.

Upper parts dark ashy, the scapulars with light terminal stripes; the entire neck purplish ashy, the feathers lanceolate, and towards the chest with white central shaft-stripes, diminishing towards the upper part into fine shaft-lines; the under surface white, the chest-feathers with ashy margins; forehead ashy brown; crown and sides of the head dark reddish ashy, the crest-feathers 6 inches long, concolorous with the head and some with light shaft-lines; chin and gorge whitish tinged with ash-brown; under wing white.

Obs. Doubts have been expressed as to whether the Indian and African birds are the same; but I apprehend that they are both of the one stock, those that visit India being doubtless stragglers migrating from Africa along the coasts of Arabia to the former country. There appears, at any rate, to be no difference either in dimensions or plumage between Indian and African birds.

Distribution.—The collection of the Colombo Museum has lately been enriched by the acquisition of two specimens of this magnificent Heron. The first was shot by Mr. Le Mesurrier on the 4th April, 1878, on the banks of the Mahawelliganga, a few miles above Kandakardu in the Tamankada pattuwa; the second, a female, was killed in the beginning of 1879 at Palatupana, in the Kirinde district, by Mr. Exham Swyny, another example, probably its mate, being seen about the same time at Willapalawewa. Prior to the date of meeting with the first of these examples the bird had never been heard of in Ceylon; but it may have perchance strayed to the island before during the north-east monsoon.

In India it is very rare. Jerdon says that he observed it once on the banks of a river at the foot of the Khasia hills, and in 1845–46 Blyth obtained several specimens in the Calcutta bazaar which are said to have been taken at a salt lake near Calcutta. Since then the species has not been heard of; and Mr. Hume, who has used every exertion to learn something of its distribution in India, and has shown preserved specimens to Calcutta fowlers, who say they have never seen it, has been quite unsuccessful in obtaining any information of the recent occurrence in India of this Heron. He, however, from his remarks concerning some Herons seen in Sindh in 1872, seems to have met with it there. He speaks of six gigantic Herons which baffled all his endeavours to get within shot, and which were twice as large as the common species, and nearly as tall as a pair of Cranes with which they consorted. These could have been no other than the present bird. Westward of this latter region it probably occurs along the shores of Arabia to the Red Sea and the adjacent portion of the continent of Africa, which appears to be its true home. Von Heuglin met with it on both shores of the Red Sea up to latitude 24° N., southwards in the Gulf of Aden, also throughout Abyssinia (whence Rüppell described his specimen) up to 6000 feet elevation, and finally in Tallah, Senaar, East Kordofan, and the country of the White Nile, as far south as the equator. It extends down the eastern side of the continent to the Cape, having been obtained on the Zambezi, at Mozambique, and at Lake Nyassa in the interior, and in all probability it occurs on the shores of all the great inland seas. In the Transvaal Mr. Ayres recently procured it; and in the Lydenburg district Mr. F. A. Barratt met with it on the Vaal river. Layard speaks of it as a regular inhabitant of the bays and mouths of the rivers in Natal, and writes of a male specimen which was procured in Cape Colony at Colesberg. It has been found in Madagascar, and of its occurrence there Messrs. Hartlaub and Schlegel speak. In his 'Birds of Damara Land' Mr. Andersson remarks:—"These fine Herons are not uncommon in the Lake-regions, from whence they make temporary and solitary excursions into Damara Land during the wet season. I have met with them," he says, "on the rivers Okavango and Teoughe, at Lake Ngami, and thence eastward to the river Botletlé." Northward it has been obtained in Gaboon and also in Senegambia; but I am not aware that it has ever been noticed in Morocco or anywhere along the north coast of the continent.

Habits.—This Gigantic Heron frequents the mouths and banks of large rivers and the borders of both fresh- and salt-water lakes. It appears to be almost exclusively a fish-eater, but devours worms, frogs, and reptiles when it encounters them. Mr. Ayres speaks of an example which he shot in the Transvaal having

devoured a whole catfish of at least two pounds in weight, with a head as broad as his hand; it "had dexterously speared it right through the body behind the head with one mandible, and had evidently clasped it with the other." A second example had swallowed a carp of the same weight. Possessed of such a powerful bill it becomes a formidable enemy when wounded. Mr. Bligh writes me that when the example above alluded to was winged with a charge of No. 2 shot a cooly was sent into the water to capture it; but the Heron turned on him and fairly kept him at bay until it was killed by a second discharge of small shot. On the Red Sea Von Heuglin noticed it in small parties, sometimes numbering ten individuals; but elsewhere he found it singly or in pairs. At the seaside he observed it frequenting creeks and islands where the ground was soft, coral reefs, and places overgrown with *Qondel* and *Shora* trees, among which large stretches of ooze had formed. In the Nile district it was to be seen about streams, brooks, swamps, watercourses, and also on the open steppes. He remarks that although a melancholy sort of bird it displays an uncommonly shy and watchful disposition, feeding only in places where it can see far all round, and reposing on wide-stretching sand banks. Its flight is slow and sluggish, with some noise; and if it is suddenly disturbed it gets up screaming, its loud note falling on the ear like the bark of a large dog. The individual in the Zoological Gardens I found to be a savage bird, but fond of his keeper, from whom it expected food when he visited it. It welcomed him with its wings outspread and its head and neck lowered nearly to the ground; and while it kept up a constant flapping of its huge pinions it opened its bill wide and emitted a low gurgling cackling note, which increased into a kind of roar when it became excited, and erected its large crest.

Von Heuglin believes this Heron breeds near the Red Sea on Qondel trees.

ARDEA CINEREA.

(THE GREY HERON.)

Ardea cinerea, Linn. Syst. Nat. i. p. 236 (1766); Blyth, Cat. B. Mus. A. S. B. p. 278 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 110; Jerdon, B. of Ind. iii. p. 741 (1864); Holdsw. P. Z. S. 1872, p. 477; Von Heuglin, Orn. N.Ost-Afr. iii. p. 1053 (1873); Hume, Str. Feath. 1873, p. 253, et 1876, p. 465, et 1879, viii. p. 112 (List of Ind. B.); Salvadori, Uccelli di Borneo, p. 344 (1874); Legge, Ibis, 1875, p. 403; Hume, Nests and Eggs, iii. p. 610 (1875); David & Oustalet, Ois. de la Chine, p. 437 (1877); Davison & Hume, Str. Feath. 1878 (B. of Tenass.) p. 472; Dresser, B. of Eur. pt. 41, 42 (1875).

Ardea leucophæa, Gould, P. Z. S. 1848, p. 58; id. B. of Austr. vi. (1848).

Le Héron commun, Buffon, Hist. Nat. vii. p. 343.

The Common Heron of European authors; *Garça real*, Portuguese; *Garza*, Spanish; *Fisch-Reiher*, German; *Blaauwe Reiger*, Dutch. *Bou-ank*, Arabic; *Aishoush*, Moorish; *Kabud*, Hind.; *Anjan*, *Sada kanka*, Bengal.; *Saa*, Sindh; *Narraina pachi*, Telugu; *Narrayan*, Tamil (Jerdon); *Zaplia seraya*, Russian, Central Asia (Prjevalsky); *Ukar*, Turki (Scully); *Changa-awu*, Java (Horsf.), *Lou-sse*, Chinese.

Kallapua-Karawal-koka, *Induru-koka*, Sinhalese.

Adult female (Ceylon). Length 38·25 inches; wing 17·0; tail 7·0; bare tibia 2·0; tarsus 5·6; middle toe 4·0, claw (straight) 0·6; bill to gape 5·8, at front 4·5.

Adult males (Yarkand). Wing 18·0 to 18·2 inches; tarsus 6·0 to 6·5; bill from gape 6·3 to 6·5, at front 4·85 to 5·3; bare tibia 2·8 to 3·7 (*Scully*).—*Females.* Wing 17·7; tarsus 6·25 to 6·3; bare tibia 3·1 to 3·2; bill from gape 6·15 to 6·25, at front 4·8 to 4·85.—*Females?* (China). Wing 17·0; tarsus 5·7; bill at front 4·6.—*Female?* (Japan). Wing 17·0 inches; tarsus 6·0; bill at front 4·6.—*Male and female* (England). Wing 17·5 to 18·5; tail 5·0 to 6·5; tarsus 5·5 to 5·8; bare tibia 3·0 to 3·2; bill at front 4·5 to 4·9. (Australia: *A. leucophæa*) Wing 19·0; bill to gape 7·0 (*Gould*).

Iris golden yellow; loral skin greenish; bill dusky yellow; culmen brownish; legs and feet greenish brown, with the tibia and posterior part of the tarsus greenish yellow.

Male. Forehead, crown, throat, face, and down the centre of the throat white, a broad black band on the sides of the head, commencing just in front of the eye and passing to the occiput, where it forms a lengthened crest, the three longest feathers measuring 5 or 6 inches; neck ashy grey, tinged slightly with reddish, down the white part of the throat a double row of black drop-shaped spots, commencing about 6 inches from the chin, and connecting with two tufts of black "decomposed" plumes on each side of the chest, over which droop a series of long lanceolate feathers, in some specimens 6 inches in length; under surface white; axillaries and flanks blue-grey, with a broad band of black running from the chest-patches down the sides of the breast to the thighs; back, tail, and wings bluish grey; the upper scapulars and interscapular region shaded with darker grey, and the longer scapulars pale grey and very long and lanceolate; greater wing-coverts pale blue-grey; the point of the wing and the edge above and beneath white; primaries with their coverts and the winglet slaty black, the secondaries the same near the tips, and slaty-grey towards the base; tertials slaty grey; shafts of the tail-feathers blackish, under wing-coverts slaty.

Female. Plumage generally duskier than in the male, the occipital crest-plumes not so lengthened, and the breast-plumes not so long.

Nestling: partly in down (Holland). The feathers, which are appearing all over the body, are black on the head, white

on the face and throat, pale slate-grey on the nape, rufescent down the fore neck, slaty brown on the back and wings, and whitish on the breast and underparts; the head-feathers are supplemented by the long grey hairy down of the unfeathered nestling. The "powder-down tracts" are developed from the first.

In the *first plumage* the colour of the back, wing-coverts, and hind neck is ashy brown; the scapulars, tertials, and tail slaty brown: head brown, the feathers with pale mesial lines; the occipital feathers are about 2 inches in length and the sides of the occiput are blackish brown; throat and centre of the fore neck white, the sides of the chest and flanks ashy brown like the hind neck; the black stripes down the centre of the throat tinged with brown, and the tuft at the sides of the chest darker brown than the surrounding plumage, the feathers having whitish central stripes.

After the moult the plumage above is more slaty, but still brownish; the head is blacker, no white on the crown; the pectoral tufts blacker, with broad white stripes.

Immature male in 2nd year (January: Ceylon). Length 40·0 inches; wing 16·5; tail 7·0; tarsus 6·0; middle toe 3·8, its claw (straight) 0·67; bill, gape to tip 6·15.

Iris dingy yellow. Bill—upper mandible dusky reddish brown, the lower fleshy yellow, except at tip; tibia and tarsus vinous brown, paler behind.

Head bluish grey, whitish at the base of the bill, centre of the forehead blackish grey; occipital crest black, but not continued forward over the eye as in the adult, but the space behind the eye is blackish brown, two of the centre feathers with a white mesial line; throat, neck, chest, with the pectoral plumes (which are not elongated), and the under surface white; the black spots down the fore neck fewer than in the adult; lower part of the hind neck bluish grey, darkening into the grey of the back, which is browner than in the old bird; quills the same, the inner webs of the greater wing-coverts brownish slate; tail dark bluish grey; under wing-coverts patched with brownish slate near the edge.

This specimen is in partial moult; the upper surface is in abraded plumage, but the plumes of the breast have the appearance of being new, and there is no sign of the black chest and flank-feathers; so that these, together with the bands at the sides of the head, do not seem to be acquired until after the second moult, or when the bird is in its third year. Some examples, however, have, in the second year, a row of blackish dashes down the sides of the breast in continuation, as it were, of the row down the centre of the throat.

Obs. The grey tints of this bird seem to fade in the tropics; and I question if Ceylonese and perhaps Indian examples are not paler, as a rule, than those from cold climates. A female in my collection has the neck almost white, as also the pectoral plumes.

It is probable that the *Ardea brag*, of Is. Geoffr., founded on a Cashmere specimen, was an abnormally coloured example of the present species. Bonaparte says that it is "smaller, with the whole top of the head black; a long black crest, with the feathers much elongated, and the dorsal plumes dull and somewhat decomposed" (fide *Jerdon*).

The Australian race (*A. leucophæa*, Gould) was separated from the European by its describer on account of its alleged larger size and the upward tendency of the terminal half of the bill. The plate in the 'Birds of Australia' depicts, in all other respects, our species, and it is generally considered that *A. leucophæa* is identical with *A. cinerea*.

Distribution.—This well-known bird is tolerably common throughout the northern, eastern, and south-eastern portions of the island; but it is a straggler to the Western Province south of Chilaw, not breeding, so far as I am aware, between that locality and the Wallaway river. In the south it is to be met with in the Kattregama district, and probably in suitable places at tanks and swamps between there and Batticaloa. It is to be found at Ambaré and Rugam tanks, and in the Tamankada pattuwa it is not uncommon; it frequents the Minery Lake and the Kanthelai tank, and about Tamblegam and in the vicinity of small tanks along the north-east coast it is resident. At Sieventhamurrippu, in the Tirai district, Capt. Wade-Dalton met with it; and I have seen it near Jaffna. At Padewayia and other tanks which abound in large Waders it is doubtless to be found; and in the north-west, at Aripu, Mr. Holdsworth has met with it. In the N.W. Province, Mr. Parker has found it breeding at Nikaweratiya tank.

This Heron is met with throughout India; but is not so common on the eastern side of the Bay, where it has been procured of late only at Thayetmyo by Capt. Feilden; and at Thatone and on the Pakchan river, in Tenasserim, by Mr. Davison. It has not been noticed in the Andamans or Nicobars, although Mr. Hume

met with it on two islets in the Laccadives, and believes that it breeds there. It is recorded as common in the Deccan and in Chota Nagpur, the localities in which Mr. Ball procured it being the Rajmehal hills, Sirguja, Sambalpur, Orissa, Nowagarh, and Karial; about Calcutta it is not very common, but in Furreedpore it is more plentiful. It is found throughout Northern India, and frequents moderate elevations, as well as the plain country, as Mr. Hume has found it breeding up to 5000 feet elevation. It is very common in many places in the north-western district of the peninsula, swarming in Sindh, according to Mr. Hume, and being abundant on the plains of Guzerat, but rare in Rajpootana about Sambhur. Turning to the north-west, we find it in the Punjab and in Cashmir, where Dr. Henderson found it breeding at Srinagar; beyond the Snowy range it is resident at Kashgaria, having been found there about the Panir Lakes, Yarkand, and Kashgar by Drs. Stoliczka and Scully; the latter traveller says it was very common during his sojourn in those regions, and though not frequenting the vicinity of Yarkand from April to August, was found in large numbers near Karghalik. Severtzoff found it breeding in Turkestan up to an altitude of 4000 feet; and Radde found it common in Dauria, breeding in the Aral Islands on the ground; he likewise met with it on Lake Baikal. Schrenck says it is generally distributed along the Amoor, being most common on its southern portion. Prjevalsky found it tolerably abundant in Dalai-nor and in the Hoang-ho valley; he also obtained it in Kan-su, but did not see it in Koko-nor; he says it arrives in S.E. Mongolia at the end of March, and is very common in the Ussuri country. In North China it is, according to Père David, very plentiful, breeding even in the interior of the city of Pekin. Swinhoe records it from the southern parts, and from Hainan and Formosa. In Japan Messrs. Blakiston and Pryer record it from Tokio and Yezo. It has not been noticed in the Philippines; but in the Malay archipelago Horsfield met with it in Java, and Salvadori doubtfully includes it in the avifauna of Borneo. Further south still it appears to stray to Australia, where Gould met with it in 1839 in South Australia, and received a skin from New South Wales.

Returning to the west of Asia and Europe, we find that Mr. Blanford observed it in Persia, Mr. Danford met with it on the Sihoun river in Asia Minor, and Canon Tristram saw it in Palestine. It is found on the Caspian, and in Southern Russia is common. All through Europe it is pretty generally distributed, migrating north in the summer as far as lat. 68° in Norway. In Denmark and in Sweden and Norway it is a summer visitor, and in some parts of Germany is the same, stragglers only being seen during the winter. It is very rare in Finland; but in Central Russia it is common in some districts, and inhabits both slopes of the Ural mountains. In Belgium, Holland, Great Britain, France, and Spain it is resident, and also in Southern Italy; but in the northern parts of that country Salvadori says it seldom remains. It is resident in Sardinia and Sicily, and a spring and autumn visitor in Malta. It is common in Portugal, and is very abundant near the Straits of Gibraltar in winter according to Col. Irby, a few remaining about Casa Vieja throughout the year. It is migratory, according to Favier, in Tangier; but many are resident as well. Mr. Tyrwhitt-Drake likewise met with it in Morocco. In Egypt Capt. Shelley says it is found throughout the country, and also in Nubia. Von Heuglin says it is found in small numbers all over North-eastern Africa, but more so in the winter than in the hot season. It extends down the east coast to Zanzibar and Mozambique, and thence to the Cape, where it is abundant and resident. Mr. Buckley met with it on the Limpopo, and Mr. Ayres in Natal. It has also been obtained on the Comoro Islands, Madagascar, and Mauritius. On the western coast of Africa, Mr. Andersson met with it commonly on the sea-shore and occasionally inland at Ondonga; further north it has been recorded from Angola, Gaboon, Gambia, and the Gold Coast. In the Atlantic isles it is widely distributed but not common. Mr. Godman met with it in Teneriffe and in the Azores, and says it is occasionally seen in Madeira. Dr. Dohrn records it as a straggler during migration to the north in the Cape Verds. It is found in the Outer Hebrides, and also in the Faroes as a straggler. In Greenland it has twice been met with, according to Professor Reinhardt, who contributes an interesting note on the subject of its occurrence in 'The Ibis,' 1861, p. 9, by which it appears that one was seen on the 27th of August, 1765, by the missionary Stach, and that another was found dead in 1856 near Neuortalik.

Habits.—To most of my English readers it would seem superfluous for me to remark much on the habits of this well-known bird; but there are many in Ceylon to whom the species is almost unknown, for it is an inhabitant of the wilder districts, and is scarcely so well known as the next bird to be noticed. The Common Heron is found about salt lagoons and forest-begirt tanks not far from the sea-shore; it is, as in Europe, very

shy and keeps well out in the water, when it is shallow enough to wade at a distance from the shore. When looking for fish it stalks along with slow and stealthy tread, generally going in one direction; the neck is stretched out and carried at an angle of about 45°, and the bill held pointed down at right angles to the neck; occasionally I have seen it wading in water up to the body, and with its neck held stiffly out, giving an awkward appearance to the bird. In tidal rivers it usually walks down stream, looking out for fish coming up with the tide; but at the sides of pools and ponds it stands motionless, keenly eyeing the water, with neck drawn in, until a fish is espied, when it darts on it with the utmost rapidity and an unerring aim. Quantities of fish are consumed by Herons, its great partiality being for eels in countries where these abound; but their diet is by no means confined to fish, for, in the winter especially, they frequent the rocks on the sea-shore, and feed on shrimps, crabs, and shell-fish. Water-rats and mice are not unfrequently captured, and bolted head foremost; and in attempting this the Heron sometimes loses its life. Of late years two instances have come under my notice in which birds have been choked in attempting to swallow a rat too large for the throat. In one case a very large rat had been swallowed, and a second was found with its hind quarters hanging from the gape, and the shoulders firmly jammed into the throat. This species will sometimes pounce on a dead bird, as I am informed by a gentleman in Wales, in whose grounds a large Heronry is situated, that he once shot at a Jack-Snipe, which flew some distance and then fell, when it was no sooner snapped up by a Heron which had been flushed by the shot and was flying past where the Snipe dropped. The Heron feeds a good deal by night, frequenting streams flowing through marshes on moonlight nights.

The flight of the Heron is slow, being performed with heavy flaps of the wings; the neck is drawn quite in and the feet extended, the legs brought close together, and sometimes the feet are crossed; and just before alighting, as I observed when standing in a heronry and looking up at the birds, the hind toe is stretched out as if to get ready to perch on the first branch to hand. The ordinary note of the Heron is a loud *krāāk* repeated at intervals; but while breeding its voice is varied. A pair, on alighting on different trees, call to one another with a deep-sounding note like *kronk-kronk*, and when sitting down on their nests one hears a low contented sort of call—*krak, krak, krak*, quickly repeated. It is remarkable how well Herons hold with their feet to a small branch; they are capable of alighting on mere twigs, and keep themselves balanced by flapping the wings. In India, as in Europe, the Heron has always been a favourite quarry for the Falcon, and is said sometimes to inflict severe wounds on its captor with its powerful beak; but, as is remarked by Jerdon (an extract from whose article I have given at p. 104 of this work), it is considered in India quite erroneous that the Heron ever transfixes a Falcon with its bill.

In parts of India this Heron is kept for decoy purposes, as also for food, its flesh being esteemed by the natives. Mr. Hume thus writes of it as observed in Sindh:—"About every fisherman's village hundreds may be seen perched about on the boats, or stacks of brushwood thrown into the water, and on poles, perfectly motionless, and more like stuffed than living birds. The eyelids of all are sewn up; they dare not move, poor things, and wherever they are placed for the day, there they remain immovable. Generally they are lightly tethered by one leg; but I saw several, perhaps old prisoners, in no way tied. Now and again they run their bills along their feathers, or flap their wings feebly; but, as a rule, they stand like statues. The people feed them liberally, and say they grow very fat in confinement, and obviously appreciate them as much as an article of diet as our ancestors appear to have done. Sometimes these birds get loose in this way, or being loose, take it into their heads to fly. I myself saw one go off in this way, and then it mounted in short circles straight up into the sky until we entirely lost sight of it; and this, the boatman assured me, was what invariably happened in similar cases. What eventually comes of these no one seems to know; of course they must ultimately drop exhausted to the ground, but probably at great distances from where they started, for the fishermen say that never, by any chance, do they again see a bird that thus escapes."

Nidification.—The nesting-season of the Heron in Ceylon varies between November and March, in which latter month it commences to lay in England. In the eastern and northern divisions of the island, wherever there is a large breeding-colony of Pelicans, Comorants, Egrets, or Ibises, one is sure to find a few pairs of Herons nesting. They breed at Uduwila and other places in the south, near Trincomalie, Kokelai, and Mullaittivu, and in the Kurunegala district at Nikaweratiya. Besides these situations known to me, there must be many other spots in the northern half of the island. I have found the nests in low trees growing in the

water, and built with those of the White Egret (*Herodias alba*). They are large platforms constructed of good-sized sticks, and measure from 18 inches to as much as 2 feet 6 inches across; but their size depends upon the particular description of fork-branch on which they are constructed. The eggs vary from two to three in number, and are broad almost perfect ovals in shape, the ends in some being slightly pointed. In texture they are rougher than those of the next species; two specimens taken at the Heronry at Kodiyam Kulam measure 2·48 by 1·68 and 2·45 by 1·72 inches, and are uniform pale sea-green in colour.

In England, where the Heron breeds alone and not in company with other birds, large numbers congregate together, as many as 100 pairs or more being found in some places. They select by choice Scotch firs, where they are to be had, and build as many as five or six nests in one tree. At a regular date every year, about the latter end of February, the occupants of the Heronry return and set about the work of repairing their nests, commencing to lay in about ten days after their arrival. When sitting on their eggs the head is drawn on to the shoulders, and no sign of the bird can be seen from beneath the nest. When disturbed the old birds manifest considerable anxiety for their eggs, flying round above their nests, and after several attempts at alighting, summoning up courage to settle on them again. The eggs take nearly five weeks to hatch, and the young are about two months before they can fly. They remain about the nests long after they are able to fly, as the Herons are often far from water, and the young are a long time before they can muster courage to go off and fish for themselves. The consequence is a second brood is commenced before the first have left the Heronry, fresh eggs and fully grown young having been found in the same tree. While these birds are about the nests they are fed by the parents now and then during the day; and quantities of fish are found lying beneath the trees in large Heronries, which have been dropped while being taken from the old birds by their inexpert progeny. In the tropics, where the nests are usually constructed in trees standing in water, the young leave them as soon as they are able to fly at all, and commence foraging for themselves in the surrounding jheel or tank. The voice of the young is sharper than that of the adult; but it varies, consisting of several differently-toned notes.

ARDEA PURPUREA.

(THE PURPLE HERON.)

Ardea purpurea, Linn. Syst. Nat. i. p. 236 (1766); Blyth, Cat. B. Mus. A. S. B. p. 278 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 110; Jerdon, B. of Ind. iii. p. 743 (1864); Layard, B. of S. Afr. p. 306 (1867); Holdsw. P. Z. S. 1872, p. 477; Heuglin, Orn. N. Ost-Afr. ii. p. 1051 (1873); Hume, Str. Feath. 1878 (B. of Tenass.), p. 472, et 1879 (List B. of Ind.), p. 114; Salvadori, Uccelli di Born. p. 345 (1874); Legge, Ibis, 1874, p. 30, et 1875, p. 403; id. J. A. S. (Ceylon Branch), p. 55 (1875); Hume, Nests and Eggs, iii. p. 611 (1875); Dresser, B. of Eur. pt. 43, 44 (1875); David & Oust. Ois. de la Chine, p. 438 (1877).

Garça, Portuguese; *purper Reiger*, *roode Reiger*, Dutch. *Nari*, Hind.; *Lal-kank*, in Bengal; *Changa ulu*, Java (Horsf.); *Balakokan*, Borneo; *Pamula nari gadu*, Tamil; *Sannary*, Tamil.

Karawal-koka, Sinhalese.

Adult male and female (Ceylon). Length 38·0 to 39·0 inches; wing 14·5 to 14·8, expanse 55·3; tail 5·0 to 5·5; tarsus 5·2 to 5·5; bare tibia 3·5; middle toe (with claw) 5·0 to 5·5; hind toe (with claw) 3·5; bill to gape 6·1 to 6·2, at front 5·0 to 5·1: weight $2\frac{1}{4}$ lbs. (India) Length 36·0 to 42·0; wing 15·5, expanse 58·0; tail 5·75; bill at front 5·39; tarsus 5·25; middle toe 5·5 (*Jerdon*, who states that some birds are much smaller).—*Male* (England, Brit. Mus.). Wing 14·6; tail 5·5; tarsus 4·9; middle toe 4·3; bill at front 4·9.—*Female*. Wing 14·0; tarsus 4·3; bill at front 4·3.—*Male* (Java). Wing 14·3; tarsus 5·0; middle toe 4·3; bill at front 4·9.

Note. This Heron is remarkable for the great length of its toes.

Iris pale clear yellow, gamboge-yellow in some; loral skin and base of lower mandible yellowish green; upper mandible dusky yellowish brown, with the margin yellowish; lower mandible yellowish; tibia and inner edge of tarsus with the soles citron-yellow, rest of tarsus and feet wood-brown.

Adult female (Ceylon, February). Head, nape, with crest of several long feathers glossy black, passing down the hind neck in a stripe for about half its length; a black streak from the gape beneath the eye passing over the ears and joining the black of the nape; another black stripe passing from the cheeks down the side of the neck to the elongated neck-plumes, and a pure black streak down the fore neck; lower part of hind neck, back, and wing-coverts bluish slate, tinged with greenish brown on the interscapulary region; upper scapulars with the webs open and elongated, the terminal portion cinnamon-red; primaries and their coverts, as also the winglet, blackish slate; secondaries paler; tail dark slate; chin and upper part of throat white; face, sides of neck, fore neck between the stripes, and many of the feathers of the lower neck-plumes cinnamon-rufous, palest above the eye, leaving a white streak next the black cap; the longer feathers of the neck-plumes white, striped with black in continuation of the neck-feathers; sides of the chest and breast dull maroon-red; centre of the breast, the abdomen, and under tail-coverts blackish slate tinged with ashy; thighs light ferruginous; flanks and axillaries bluish slate; under wing, together with the point and edge along the ulna, light ferruginous.

In a male (December) the occipital feathers are longer and the scapulars are purplish and ashy red, being more richly coloured than in the above female; the sides of the head behind the eye are white and not tinged with rufous.

Young, on leaving the nest (Female, Kodiyam Kulam). Wing 11·0 inches (quills not grown); tail 4·0; tarsus 4·5; middle toe 4·0; bill at front 3·7, blunt at tip, the gonys only 1·0 in length.

Iris bright clear yellow; orbital skin yellowish green; upper mandible dark brown, with a yellow line running forward from the eye; under mandible saffron-yellow; tibia and knee greenish yellow; tarsus and toes in front olive-brown, posteriorly yellowish.

Crown and nape black; sides of the head and upper part of the neck rich glossy cinnamon-rufous, changing gradually into slaty brown on the hind neck, and thence into glossy green-brown on the back, scapulars, and wing-coverts,

which are broadly margined with yellowish rufous; primaries, winglet, and tail dark slaty, slightly glossed with green; secondaries paler slaty, glossed in a similar manner; chin and throat white, the narrow black stripe in front as in the adult; sides of the fore neck striped with black, and the rufous ground-colour paling on the chest and under surface into rufescent buff, with broad slaty stripes, except on the abdomen and vent; the latter almost white; under tail-coverts, thighs, and edge of the under wing yellowish rufescent.

An immature bird in first year, and about one year old, measures—Length 36·2 inches; wing 13·2; tail 4·5; tarsus 4·0; bill to gape 6·0.

The plumage is less rufous than in the nestling, the back being slaty grey, with the edges of the scapulars and wing-coverts rufous; the under surface buff-grey, with a few brownish-red feathers on the breast.

Distribution.—This very handsome Heron is fairly common in the well-watered districts of the low country, and is much more numerous in the west and south-west than the last species, though the latter outnumbers it, I think, in the Eastern Province. It is to be found about the marshes near Borella; in the Mutturajawella swamp, at Kotte and near Kæsbawa; and at Bolgodde and Amblangoda Lakes it is numerous. On inland paddy-fields in the Galle and Matura districts it is likewise met with. In the south-east about the tanks near Kattregama, and at similar sheets of water in the Eastern Province, it is to be found in limited numbers; and towards Trincomalie it is commoner again about Topoor and other tanks, and also towards Jaffna near salt lagoons where there are marshes surrounding them. It is distributed throughout the tanks of the interior from Kurunegala westward to Elephant Pass. In the peninsula it is likewise found at the head of the great lagoon near Ethelamaduvil, and at Pt. Pedro Layard met with it. It occurs down the west coast to Chilaw and Negombo in tolerable numbers, and near Calpentyn Mr. Nevill has found it breeding.

In India it is widely distributed in well-watered districts. Mr. Bourdillon found it abundant in Travancore, at the Vellarny Lake near Trevandrum, and in other similar localities it is no doubt plentiful. In the Deccan it is sparingly distributed, but common near Khandala (*Fairbank*). It is found throughout Chota Nagpur, being recorded from the Rajmehal hills, Manbhum, Hazaribagh, Lohardugga, Orissa, Nowagarh, and Karial. About Calcutta it is moderately plentiful; in Furreedpore common and resident; in Cachar plentiful in the rains; in Burmah local, being abundant near Thayetmyo, but not recorded from other places; and in Tenasserim it is very sparingly distributed (*Hume*), being recorded only from Thatone, Tavoy, and Khyketo. It extends to the Andamans and Nicobars; in the former it was procured by Mr. Hume at Tillangchong, by Mr. Davison at Aberbeen, and by Capt. Ramsay at Pt. Blair. In the Nicobars the second-named gentleman got it at Trinkut. Following it southward to the Malay archipelago, we find that Mr. Buxton procured it in Lampong, Sumatra, and Mr. Everett in Sarawak, Borneo, where, however, it is uncommon and seen only during the north-east monsoon; in the latter island it has also been procured at Baujermassing and Pagattan. In Labuan Mr. Mottley met with it, and Horsfield records it from Java. In Northern Celebes Herr Meyer found it common, and he likewise procured it at the Togian Islands. In the Philippines Meyen obtained it at Manilla; and in China it is rare, Swinhoe recording it from Hankow, and Père David from the province of Sezchuen and the vicinity of Pekin. It is not noticed from Japan by Mr. Blakiston, though Messrs. Finsch and Hartlaub say that it occurs there. Though ranging as far north, according to Pallas, as lat. 55° in Siberia, it seems to be rare in these regions, as I find no other record of its occurrence north of Turkestan, where Severtzoff says it breeds. This region brings us back again to North-west India, where Mr. Hume says it is common on the banks of the Indus, and about rushy tanks and streams in Sindh, Kutch, Guzerat, and Kattiawar. In Guzerat Capt. Butler met with it in most of the marshes in the plains. Throughout the northern parts of India towards the east it is found in suitable localities, and appears to be common in the Etawah district.

In Palestine Canon Tristram found it abundant in the marshes of Huleh, and says it is resident in other parts of the country; and Mr. Danford records it from Kaiseriyeh in Asia Minor. It is common in Southern Europe, being recorded as such in Bulgaria (*Elwes*), Southern Russia (*Nordmann*), on the Danube (*Dresser*), and in Greece (*Krüper*). Lord Lilford says that it inhabits the Ionian Islands, and breeds in the Epirus. In Transylvania it is abundant, according to Messrs. Danford and Harvie Brown; and in Italy it is tolerably common, breeding in the country, but not remaining in the winter, though it does in Sicily. In Sardinia it is a bird of passage; and in Malta Mr. Wright met with it only in spring and autumn. It is common

in Spain and Portugal, breeding in large numbers, but does not remain throughout the winter. It arrives near Gibraltar, according to Col. Irby, about the 4th of April. It is tolerably common in France in the summer, and is found in Holland and Belgium, but has not been met with in Denmark, though it has occurred once in Sweden. In Northern and Central Germany it is rare, and to the eastward has not been found at all in Central Russia. It is a rare straggler to Great Britain, having been met with, writes Mr. Dresser, in most of the southern counties, and has been obtained in Scotland as far north as Wick. Concluding with Africa, we find Favier recording it as a summer visitor to Morocco; and it is resident, according to Loche, in Algeria. In Egypt it is a resident and plentiful in some parts, Capt. Shelley instancing the lake of Birket el Korn as being frequented by it in great numbers. Von Heuglin found it all over North-east Africa—throughout the year on the Red Sea coasts, in July and August at Massowa, in autumn on the Somauli coast, and in winter and spring in Abyssinia up to 9000 feet. It has been obtained on the Zambesi, and in the Transvaal it is common, Mr. Buckley finding it breeding there. In Madagascar it has been met with by Messrs. Roche and E. Newton; and in Cape Colony Layard found it common in all marshy places. In Damara Land Mr. Andersson obtained it on the rivers Okavango and Teoughe and at Lake Ngami, and on the west coast of the continent it has been recorded from Casamanse and Bissao. It must needs be abundant in this region in some localities hitherto unexplored, as all the birds which pass southwards from Spain and Morocco in the autumn must winter in West and South-west Africa. I find no record of its occurrence in the Cape Verds; but in Madeira Mr. Godman says it is found, as also in some of the Western Islands or Azores.

Habits.—This handsome Heron frequents marshes more than the banks of streams or margins of lakes, and is particularly fond of tracts of ground covered with long grass and rushes, and interspersed with small water-holes, by the side of which it watches for fish and frogs. I have more than once detected it at a long distance by perceiving its long neck and head peering above the tops of reeds and rushes, and have been able thus to stalk it. Jerdon observes the same habit, and says that its head and neck looking like a snake when in this position has suggested for it its Telugu name. Like the last species, it is seldom seen in company with other Herons; and for the most part I have observed it to be solitary, for more than two or three I have never seen in any marsh together. It often feeds by night, particularly when the moon is up, when it stalks along the edges of streams and water-holes in swamps. It is a very shy species, except when breeding, at which time it will perch readily in trees close to the observer. It roosts on islands, or in any out of the way unfrequented localities, in some of which I have found it resorting to low trees or tall scrub to perch on; but in places where it abounds the *Pandanus*, or screw-pine, is selected by choice.

The flight of the Purple Heron is buoyant but slow, and performed with heavy flappings of its ample wings; it often soars for a short time like the Common Heron. When alarmed it rises with a loud call, which is very like that of the Common Heron, but more guttural.

Nidification.—This Heron breeds in the Western Province in the vicinity of Bolgodde Lake, the marshes round which it permanently inhabits. I found it nesting there in an impenetrable *Pandanus*-thicket in the month of December; but I was unable to ascend the trees to the nests, which appeared to be formed by bending down the leaves of the screw-pine, and on the platform thus formed laying dried reeds and flags. Mr. Hugh Nevill, C.S., who found it breeding in a similar locality near the Puttalam Lake, describes the nests as made in this manner; and it seems, therefore, that this expedient is generally resorted to when breeding in screw-pines. A few pairs were nesting at Uduwila tank near Kirinde in March 1872, but the young were all hatched out. In the north I have found the eggs in December but slightly incubated. At Kodiyam Kulam there were about a dozen pairs breeding, the nests being made on the same trees as those of *Herodias alba*. They were large structures of sticks, more bulky than those of the Grey Heron; the upper surface was only slightly hollowed, there being scarcely enough depression to keep the eggs from rolling out; and indeed, at Bolgodde, I found an egg on the ground, which had probably fallen on this account from the nest. Three is the usual number of eggs in a nest, but in some I only found two. They are rounded ovals, as those of the last species, but they are occasionally pointed at one end. A specimen before me resembles a Gull's egg in shape and measures 2·19 by 1·55 inches. The eggs are paler than those of the Grey Heron, being very light bluish green and some almost bluish white; they vary in size from 2·05 to 2·23 in length by 1·5 to 1·6 in breadth.

The young remain long about the nest before flying, perching on the branches of trees close to their nests; but they are likewise to be seen about the tanks when they are scarcely able to fly, and then skulk among the brushwood like Bitterns. Writing of the nidification of this species in India, Mr. Hume remarks that he has invariably found the nests in thick beds of reeds or bulrushes. In a large jheel in the Etawah district, where a number of nests were found by him in August, they were made on platforms of bulrushes, thirty or forty blades being bent down to form the platform, about 2 feet above the water, on which the nests, composed of sticks and twigs of Babool- and Sheeshum-trees, were constructed; they were loose flat structures from 2 to 2½ feet in diameter. Some of the nests contained as many as five eggs. "The uproar," he writes, "was great whilst the men were robbing their nests; and the extraordinary chattering that the birds made, condoling with each other, when on reoccupying the nests they found them empty, was most comical." Mr. Hume's measurements for the eggs are—length 1·95 to 2·46, breadth 1·42 to 1·75 inch.

ARDEA* GULARIS.

(THE ASHY HERON.)

Ardea gularis, Bosc, Actes Soc. d'Hist. Nat. i. p. 4, t. 2 (1792); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1059 (1873).

Ardea asha (Sykes), P. Z. S. 1832, p. 157; Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 110.

Herodias asha (Sykes), Blyth, Cat. B. Mus. A. S. B. p. 280 (1849).

Demiegretta asha (Sykes), Jerdon, B. of Ind. iii. p. 747 (1864); Holdsw. P. Z. S. 1872, p. 477.

Demiegretta gularis (Boie), Hume, Str. Feath. 1873, p. 254, et 1876, p. 465, et 1879, p. 114 (List B. of Ind.).

Slate-coloured Heron, Sykes; *Reef-Heron* of some. *Kala bagla*, Hind. (Jerdon).

Note. The bill is slightly curved in this species and its allies.

Adult female (Ceylon). Length 25·0 inches; wing 10·8; tail 4·0; tarsus 3·7; bare tibia 2·3; middle toe 2·6, its claw 0·42; hind toe 1·2; bill to gape 4·3, at front 3·7. Pectination of middle claw rather coarse.—*Adult male and female* (Sindh). Length 24·25 to 27·5; tail from vent 3·0 to 3·8; wing 10·0 to 11·4; tarsus 3·6 to 4·4; bill at front 3·6 to 4·1; weight 1 lb. to 1 lb. 4 oz. (*Hume*). (Bombay: white variety) Length 24·1 inches; wing 10·2; tail 3·8; tarsus 3·8; bill from gape 4·2 (*Hume*). (Egypt) Length 24·0; wing 10·25 to 11·25; tarsus 4·16 to 4·1; bill at front 3·68 to 3·84 (*Von Heuglin*): the measurements for tarsus in the latter case are abnormal.

(Ceylon) Iris golden yellow; bill brownish yellow, paling to yellowish at the tip; culmen between nostrils dark brown; gape greenish; tibia and just below the knee brown; tarsus green, paling to greenish yellow at the tips of the toes.

Head (with crest of two attenuated feathers 3⅝ inches in length), neck, upper surface, and wings dark slate-blue, the scapulars and lower fore-neck plumes pale or grey-slate, the former decomposed, but the barbs joining near the tip to form a lanceolate web, which reaches to within 1 inch of the tip of the tail; lesser wing-coverts and rump nigrescent; primary-coverts and the feathers at their base on the edge of the wing pure white (the fourth feather of these coverts on the right wing is slate-coloured in the specimen under consideration); chin and throat *up to a level with the gape* white, terminating in a point on the centre of the fore neck 6 inches from the chin; under surface from the chest to the under tail-coverts blackish slate; under wing slate-blue, the lesser under coverts nigrescent.

The white primary-coverts (as proved by the presence of a dark feather on one wing) is an abnormal development of white in this specimen. Mr. Hume has recently called attention ('Stray Feath.' 1878, vii. p. 453) to a similar specimen shot in Kutch by Capt. Butler.

White variety. Not unfrequently examples of this species are found pure white throughout. These are not young birds, as was supposed by Jerdon, for Von Heuglin states that he found young nearly all white and others ash-grey in nests.

Young. The nestling, according to Von Heuglin, is either white, variegated more or less with brownish grey, or dusky ash-grey, and these appear to turn as yearlings into pure white or ashy grey respectively. The colour of the latter is much paler than in old birds; and they have, says Mr. Hume, a good deal of white about the abdomen and vent, and occasionally on the centre of the breast, and want the crest and breast-plumes. The absence of the crest seems to mark them as adolescent birds, and distinguishes them from crested adults with such a development of white as I have noticed above. It is, however, possible that old birds with white wing-coverts may have been thus plumaged from the nest.

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* I do not adopt the genus *Demiegretta* for this species, as structurally and in character of plumage it is, I consider, a true Heron. Its marine habits are certainly abnormal; but the Common Heron is, in England, much seen on the sea-shore in the autumn; and the Blue Heron of Australia (*A. novæ-hollandiæ*), by no means a marine species, may be considered to connect the Reef-Herons with restricted *Ardea*. The *Demiegretta* section, in which a white plumage is occasionally assumed, seems to lead to the next subgenus, *Herodias*, or White Herons.

Obs. The Australian and Oceanic bird (*Ardea sacra*, Gmelin), which inhabits the Malay archipelago and the islands in the Bay of Bengal, differs from the present in having merely a narrow stripe of white down the chin and upper throat, which in some specimens is almost wanting. It is shorter in the leg, and the tibia is much more feathered, the bare portion in Andaman specimens varying from 1·05 to 1·5 inch, wing 9·85 to 11·75, tarsus 2·7 to 3·1 (*Hume*). There is a white form in this species as in *A. gularis*. Messrs. Hume and Davison met with it in the Andamans, and Messrs. Finsch and Hartlaub in the Pacific.

Distribution.—So far as I have ascertained, this Heron is confined to the north of Ceylon and the west coast from Manaar down to Colombo. I have not seen it on the eastern side of the island or in the extreme south. Layard procured it from the island of Valenny, near Jaffna, and from a lake near Chilaw (where he found it breeding), and got one specimen on the Colombo Lake. I met with a small flock on the sands at Long Island, at the mouth of the Jaffna Lake, in March; there were several white birds among them, which I take to have been of the same species. A few days afterwards I saw two or three at Manaar; but did not meet with the bird again in any of my wanderings.

On the mainland it appears to be confined to the west coast of the peninsula, taking also the Laccadives into its range, at which group it was noticed by Mr. Hume at Betra Par. There is no reason why it should not extend up the east coast as far as the district opposite Jaffna, as it has been procured lower down near Tinnevelly. It has been obtained at Teetul, near Bombay, and in the harbour as well. In the Deccan Sykes procured it about 200 miles inland. Further north it is very abundant in Kurrachee harbour, about the mouths of the Indus and the adjacent creeks, has been obtained in Northern Guzerat near the Runn, and is common all along the coasts of this district and along the Mekran coast to Muscat, as far as which point Mr. Hume has observed it. It probably occurs along the shores of Arabia; for Von Heuglin found it common in the Gulf of Aden and along the coasts of the Red Sea as far north as the tropic, beyond which, to the Gulf of Suez, it is a straggler. On the east coast of the continent of Africa it has been met with at Zanzibar, Mozambique, the Comoro Islands, and also on the coast of Madagascar, in which island Mr. Newton says it is not uncommon. At the Cape it does not seem to have been noticed; but on the west coast it has been procured at St. Thomas's and Prince's islands, at Aguapim, on the Gold Coast, and in Senegambia.

Habits.—This Heron is almost entirely a littoral species, being found along the open coast and in harbours and bays, and especially affects coral reefs where these abound. In other localities, where there are sand banks and mud flats, it is to be found feeding at the edge of these, or on the ooze left bare by the tide. The flock I met with at Jaffna were busily attacking a quantity of fish which were hemmed in in a large stake-net on the sand just being left bare by the tide. They did not permit of a near approach, but rose at a very long shot with a flight similar to that of the smaller Egrets. Mr. Hume notices that the blue birds are far less shy than the white ones, as if these latter were conscious that they were more visible than their fellows, and that it was dangerous to allow themselves to be approached. He suggests that originally, when perhaps the species had not taken to frequenting open shores, all the birds were white, and that a marked change in diet might have produced the dusky tints. This species feeds on fish, crabs, small crustacea, and mollusca. Von Heuglin mentions that they are about at nights when there is moonlight, or when the tides are low.

Nidification.—Layard found this Reef-Heron breeding near Chilaw in the months of May and June. He styles the nest a "huge structure of sticks placed in trees by the water's side," and says the eggs are from four to six in number, rounded ovals, and of a pale blue colour. Axis 1 inch 10 lines (1·82), diam. 1 inch 5 lines (1·41). Von Heuglin found it nesting on the western coast of the Red Sea in the Dahlak archipelago, the nests being placed both on boulders, in clefts of rocks, and on small trees and bushes, those growing in shallow water being preferred; the nests were placed at heights varying from 3 to 10 feet. Some of the nests were lined with feathers and pieces of seaweed, and the eggs were three or four in number, of a pale green colour, and in shape somewhat compressed at both ends. In length they varied from 1·68 to 1·82, and in breadth from 1·16 to 1·25 inch.

Subgenus HERODIAS.

Bill slenderer and the gonys sharper than in *Ardea*; nostrils slightly oblique; tibia also barer; the tarsal scales more rectangular.

Plumage white; dorsal plumes elongated and highly decomposed in the breeding-season.

HERODIAS ALBA.

(THE LARGE WHITE EGRET.)

Ardea alba, Linn. Syst. Nat. i. p. 239 (1766); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 111; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1063 (1873); Dresser, B. of Eur. pt. 77–79 (1880).

Ardea modesta, Gray & Hardw. Ill. Ind. Zool. ii. pl. 49 (1834).

Herodias syrmatophorus, Gould, B. of Austr. vi. pl. 56 (1848).

Herodias alba (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 279 (1849); Jerdon, B. of Ind. iii. p. 744 (1864); Holdsw. P. Z. S. 1872, p. 477; Legge, Ibis, 1875, p. 403; David & Oust. Ois. de la Chine, p. 439 (1877); Hume, Str. Feath. 1879 (List B. of Ind.), p. 114 (in part).

Herodias torra (Buch. Hamilton), Hume, Str. Feath. 1878 (B. of Tenass.), p. 472, et 1879 (List B. of Ind.), p. 114.

Great White Heron, Lath.; *Héron aigrette*, French; *de groote Zilverreiger*, Dutch; *Gans*, Dutch in Ceylon (Layard); *Garses*, Portuguese in Ceylon. *Mallang bagla*, *Torra bagla*, Hind.; *Dhar bagla*, Bengal.; *Vella koku*, lit. "White Heron," Tamils in Ceylon.

Baddadel-koka, Sinhalese.

Characteristics. *No crest; no pectoral plumes; long dorsal train in breeding-plumage.*

Adult male and female. (Ceylon) Length 37·0 to 40·0 inches; wing 13·5 to 15·0; tail 5·0 to 6·0; tibia (bare) 3·5 to 5·0; tarsus 6·5 to 7·1; middle toe 3·5 to 3·8, claw (straight) 0·6; bill at front 3·9 to 4·5, to gape 4·9 to 5·8. (India, Tenasserim) Length 35·0 to 38·5; wing 13·2 to 17·2; tail 5·5 to 7·0; tarsus 5·25 to 7·9; bill at front 3·72 to 5·0 (*Hume, Scully*). (China) Wing 14·2 to 14·75; tail 5·0 to 5·2; tarsus 6·0 to 6·5; bare tibia 4·5; bill at front 4·3 to 4·5. (Egypt) Length 42·0; wing 16·5; tarsus 7·6; bill at front 5·0 (*Scully*). (N.E. Africa) Length 36·1 to 36·4; wing 14·1 to 15·45; tarsus 5·51 to 6·45; bill at front 4·1 to 4·85 (*Heuglin*). (Russia) Wing 16·1 to 16·3; tail 6·4 to 6·5; bare tibia 3·5 to 4·2; bill to gape 6·0 to 6·4. (Syria) Wing 16·0; tail 6·5; tarsus 7·0; bare tibia 4·0; bill to gape 6·0 (*Dresser*). (Australia) Wing 13·0; tail 5·0; tarsus 5·3; bare tibia 3·62; bill at front 4·3. (Kashgaria) *Male.* Wing 17·6; bill at front 5·05, from gape 6·6; tarsus 7·7 (*Scully*).

Breeding-plumage. Iris bright pale golden yellow; bill blackish; loral skin and space round eye greenish yellow; legs and feet black; tibia paler than the tarsus.

Entire plumage white; a train of long feathers, with stout shafts and very open lengthened and drooping barbs, arises at the base of the scapulars and extends 4 inches beyond the tail. The bill remains black a very short time, turning yellow long before the dorsal train is moulted; the tip, however, is black at this stage.

Winter plumage. Bill yellow, the tip dusky; tibia as black as the tarsus.
As in summer, but with the dorsal train wanting. In June this plumage is complete.

Young. Nestling covered with white down; the legs brownish.

Obs. The Indian race of the Large White Egret has been separated by Mr. Hume as *H. torra*, on account of its small

size. It is no doubt a small race, but not more diminutive than most of the African examples that have been met with, and is no smaller than the Chinese and Australian birds. It is a species which varies extremely in size, *tropical bred* birds being the smallest. There is, however, a regular gradation as regards dimensions from the Australian, Chinese, and Indian races up to the largest examples reared in cool climates, to which, I apprehend, the large individuals occasionally procured in India belong. Moreover, as will be seen by reference to the dimensions tabulated above, the difference in tarsus and bill of the largest birds is not proportionate to the length of wing. Under these circumstances it is not advisable to adopt any new title for the small form, particularly as we do not know whether the Linnean type was a small or a large bird.

As regards Buchanan Hamilton's name *torra*, I can find no mention of this bird in the writings of that gentleman, although there exists a reference of Franklin's—"*Ardea torra*, Buch." P. Z. S. 1831, p. 123. Giebel, in his 'Dictionary,' refers us to Bonaparte's Consp. vol. i. p. 425; but the only reference I can find in this work is in vol. ii. p. 118, where *Ardea torra*, Buch., ex Asia meridionali, is used as a synonym of *A. nigrirostris*, Gray and Hardwicke. It is possible that the title may have been used by Buchanan Hamilton as a MS. name, in which case it would not stand; and it appears to me that if a new name is wanted *A. modesta*, Gray and Hardwicke, Ill. Ind. Zool. ii. pl. 49 (1834), would be the next title in order available.

Distribution.—The Large Egret is widely diffused throughout the low country, but is most numerous in the dry districts east of Tangalla, and round that side of the island to the Vanni tanks in the north. It is to be found in all large marshes and tanks throughout the northern half of Ceylon down to Kurunegala, and south of that district may generally be met with where there are extensive tracts of wild paddy-land. In the interior between Colombo and Matara, where the fields happen to be surrounded by forest and jungle, one or two of these Egrets may usually be seen in company with the next species. It is not at all uncommon in the Trincomalie district, but I have never met with it in any great numbers. I have heard of its being observed in Dumbara, whither it ascends from the Bintenne country; but I fancy that it is nothing but a rare straggler to that elevated valley.

In India it is a very common bird, being, of course, most abundant in the better-watered districts, says Jerdon, but may be found everywhere feeding by rivers and tanks. It is said to be very common in the Deccan, and in the region between the Ganges and the Godaveri. Mr. Ball records it from Manbhum, Lohardugga, Nowagarh, Karial, and Raipur. About Calcutta it is occasionally met with; but I notice it is omitted from Mr. Cripps's list of the birds of Furreedpore. Passing eastwards I find it reported by Mr. Oates as common about Thayetmyo, and by Mr. Hume as generally distributed throughout the plains portion of Tenasserim. It is likewise found in the Andamans. Returning to India, it is recorded by Dr. Scully as occurring in the valley of Nepal in the winter; and evidently is found all along the base of the Himalayas, as also in the plains westward to the Punjab. In Sindh it is common, and is distributed less numerously throughout the entire surrounding region. In Kashgharia, which is inhabited by the largest form of the species, it is common in winter, migrating northward in the spring to breed. According to Severtzoff it breeds throughout Turkestan, and winters in the western portions of the country. Eastward we find Prjevalsky observing it in large numbers in the Hoang-ho valley. At Koko-nor it was met with at the end of March; and in Tsaidam it appeared as early as the 18th February. It is spread thoughout the Chinese empire, breeding in large numbers near Pekin; and Swinhoe met with it in Formosa. In the Malay archipelago, through which it extends to Australia, it is found in Borneo, Celebes, Halmahera, Morotai, Ternate, Timor, and the Aru Islands. It has been recorded by Mr. Ramsay from every settlement in the north of Australia, and from most parts of the east coast down to Victoria, and thence round to South Australia. Gould likewise met with it on the Clarence River and in the north of Tasmania on the mouths of rivers. Returning to Asia again, to follow out its distribution from thence westward, I find that Dr. Radde observed it in the Central Argunj valleys, and on the Lower Udir river in Siberia. Major St. John met with it in the Shiraz district in Persia; and Mr. Blanford saw it in Baluchistan; while Canon Tristram found it to be a spring and summer visitor to Palestine. In Asia Minor it is common; and in Greece slightly less numerous, though, according to Messrs. Elwes and Buckley, it is common in the marshes of Macedonia. In South-eastern Europe it is much more plentiful than further west, for in Spain it is very rare; and in Portugal it is said not to be found at all, although it is recorded by Mr. Godman from the Azores. It is likewise rare in Malta, though tolerably common in winter in Sicily and Sardinia; but it is scarce again in Northern Italy. In Transylvania it is

found on migration; but it breeds in the marshes of Hungary and in the countries skirting the Danube, this portion of Europe being, writes Mr. Dresser, its head-quarters on that continent. It is likewise met with in Southern Germany but very rarely; and the same is the case in Poland. It is, however, common in parts of Russia, particularly in the southern districts. Passing westward now, I find that this Egret is rare in France, and has only been once killed in the Netherlands. It strays still further north into Scandinavia, but does not reach Finland in its migration. It is a straggler to Great Britain, having been met with or procured more than a score of times, in most of which it has been found on the eastern side of the island, having once strayed into Scotland.

In parts of the continent of Africa it is abundant, particularly in the north-east, being found plentifully in Lower Egypt, where it breeds in the Nile delta. In Abyssinia it winters, frequenting the Blue and White Nile, and ranging into the highlands to an altitude of 9000 or 10,000 feet. Canon Tristram met with it in small flocks in various parts of Algeria, and found it wintering in the Sahara. Down the east coast it has been observed at Mozambique and Natal; and Layard met with it in various parts of South Africa, among which may be mentioned the vicinity of Cape Town and Simon's Bay; while from Madagascar it has been recorded by Messrs. Hartlaub, Schlegel, and Newton. Following up the west coast, we find Mr. Andersson obtaining the present species in Damara Land, while it is otherwise recorded from Benguela and the Gold Coast.

Habits.—In Ceylon this fine Egret affects by choice large paddy-fields and flooded marshes; but it is also encountered on the borders of tanks, and occasionally about shallow brackish lagoons. It is often met with singly and seldom more than three or four are seen together in even scattered company. It is very wary, and generally stalks about in the water or watches by pools at some distance from the surrounding cover, so that it is very difficult to approach, as it generally takes flight as soon as it perceives the shooter approaching, and flaps leisurely off to another spot, or mounts to the top of some tall tree, and there watches its pursuer at a safe distance. It is given to perching on trees quite as much if not more than either of the two smaller species; and when resting on the tops of the tall forest trees of Ceylon it presents an imposing appearance, even when in an attitude of repose. Its flight is, like that of the Common Heron, slow, being performed with measured strokes of its ample wings; and with its neck drawn in and its legs extended behind it, it forms a handsome object as it lazily flaps away to its feeding-grounds in the early dawn. I have often seen it, both feeding and flying, in the company of its smaller congeners, next to be noticed, and it invariably breeds in their company in Ceylon. It leaves its feeding-grounds early in the evening, and resorts at once to the tall trees on which it nightly roosts. It is, as a rule, a silent bird, but when put up now and then utters a single note like *kar*.

Nidification.—In Ceylon the Great White Egret nests in December, January, and February, breeding in company with Herons and other Egrets. At the colony at Uduwila a number of pairs were nesting on the same trees with Spoonbills and Pelican-Ibises. The nests were smaller, of course, than those of either of these species, and were placed on the topmost branches. The surface of the nests was almost flat, there being scarcely any hollow for the reception of the eggs, which lay on a lining of roots and twigs. At the end of March, the time of my visit, most of the young were hatched out; they either stood on the nests or took refuge in the surrounding branches, perching readily on them. The eggs are three or four in number, moderately smooth in texture, nearly regular ovals in shape, of a uniform pale greenish-blue colour. A small series in my collection vary in dimensions from 2·04 to 2·2 inches in length, and from 1·39 to 1·53 in breadth. In the north of Ceylon, at a tank near Nilāvele, this species was found breeding by me in January, nesting in trees with the Purple Heron and the two species next in order. The nests were similar to those just described, and were built on thorny trees growing in the tank. The old birds were very shy, flying off when the first shot was fired and perching on the tops of distant trees. In India this species breeds between the months of October and February, resorting, as in Ceylon, to tanks, in the beds of which there are groves of trees whose trunks are submerged in the wet season. According to Mr. Hume, the eggs vary in length from 1·88 to 2·38, and in breadth from 1·4 to 1·6 inch.

HERODIAS INTERMEDIA.

(THE PLUMED EGRET.)

Ardea intermedia (Hasselq.), Wagler, Isis, 1829, p. 659; Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 111; Schlegel, Mus. P.-Bas, *Ardeæ*, p. 19 (1864); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1065 (1873); Hume, Nest and Eggs, iii. p. 615 (1875).

Ardea egrettoides, Temm. Man. d'Orn. iv. p. 374 (1840).

Ardea plumifera, Gould, B. of Austr. vi. pl. 57 (1848).

Herodias intermedia (Wagl.), Blyth, Cat. B. Mus. A. S. B. p. 279 (1849); Salvadori, Ucc. di Born. p. 348 (1874); David & Oust. Ois. de la Ch. p. 440 (1877); Hume, Str. Feath. 1879 (List B. of Ind.), p. 114.

Herodias egrettoides (Temm.), Jerdon, B. of Ind. iii. p. 745 (1864); Holdsw. P. Z. S. 1872, p. 477; Legge, Ibis, 1874, p. 30, et 1875, p. 407.

The Lesser White Heron. Patangkha, Patokha bagla, Hind.; *Paru vallai koku*, Ceylonese Tamils.

Hotta-kallu-koka, Layard (refers probably to next species), *Sudu-koka*, lit. "White Heron," Sinhalese.

Characteristics. *No crest: long dorsal train and long pectoral plumes in breeding-season.*

Adult male and female (South Ceylon). Length 25·75 to 26·1 inches; wing 12·0 to 12·1; tail 4·75 to 5·0; tarsus 4·5; bare tibia 2·5; middle toe 3·1 to 3·2, its claw 0·6; hind toe 1·4; bill to gape 3·7, at front 2·75. Claws acute, pectination of middle toe shallow and wide.—*Adults* (India and Andamans). Wing 11·1 to 12·65; tail 4·5 to 5·9; tarsus 4·1 to 4·6; middle toe and claw 3·62 to 4·05; bill at front 2·68 to 3·05 (*Hume*).—*Female.* (Java) Wing 11·6; tail 4·5; tarsus 4·0; middle toe 2·9; bill at front 3·0.—*Male* (Canton). Wing 11·6; tail 4·5; tarsus 4·3; bill at front 2·85.—The bill is proportionally shorter in this species than in other white Egrets.

Breeding-plumage. Iris golden yellow; bill black: legs and feet black; tibia yellowish brown.
(Canton) Entire plumage white; dorsal train composed of long, pliable-shafted, highly decomposed feathers, the webs drooping, reaching 5½ inches beyond the tail; pectoral plumes of long, attenuated, and decomposed feathers 5½ inches in length.

Winter plumage (Ceylon: November). Bill yellow, the tips dusky; orbital skin greenish yellow; legs and feet entirely black. Entire plumage white, without the dorsal train and pectoral tuft.

Young. The nestling is clothed with white down.

Obs. As will be seen from the above measurements, Ceylonese specimens are not inferior in size to those from any other part. According to data in Mr. Hume's useful table of Indian Egrets (Stray Feath. vi. p. 480), the dorsal train extends 7 to 8 inches beyond the tail in some specimens. This, I presume, is exceptional, although it is represented as of great length in Mr. Gould's plate of the Australian bird. Females from the Transvaal measure in the wing 11·75 and 12·25. In a winter specimen (June) the tarsi and feet are noted as bluish.
The American representative of this species is *H. egretta*, and has the bill yellow at all seasons.

Distribution.—This Egret has much the same distribution in Ceylon as the last, and, though it will occur in some tracts of country and not in others, is, I think, quite as numerous if not more so than its larger relative. I found it common in extensive paddy-fields near Bolgodde lake in the Western Province, and also in the Galle district, particularly in unfrequented fields in the heart of jungle. In the south-east I found it breeding at Tissa Maha Rama, and noticed it in other places in the Hambantota district. In the Eastern Province it occurs here and there; and some white Egrets I met with flying over the elevated tract of country between

Bibile and Kaloday, on the Batticaloa and Badulla road, I identified as the present species. Northward, about Trincomalie and in the vicinity of various large tanks in forest districts, I met with it; but it is not so common there or in the Jaffna peninsula as *H. garzetta.* Down the northern half of the west coast it is probably distributed as in other parts, but I did not take particular notice of it there. Between Puttalam and Kurunegala it is not uncommon; and Mr. Parker has met with it in various parts of the North-western Province. In the lower valleys of the Kandyan country I have seen white Egrets; but I do not know whether they were this or the next species.

In India this Egret is common; but, according to Jerdon, not so plentiful in the south, though common in the north-east and abundant in Burmah. With regard to the latter district, I find that Mr. Hume has no recent record of its occurrence in the southern parts; but Captain Feilden met with it at Thayetmyo, and further west towards India proper it is a visitor to Cachar in the rains. In the Andamans it is pretty common, though nowhere numerous; but Mr. Davison does not record it from the Nicobars, although Mr. Hume thinks he saw it there. About Colombo it is tolerably common; but I observe that it is passed over in Mr. Cripps's list. In the western parts of Chota Nagpur it is rare; but elsewhere in that division it is common, Mr. Ball recording it from Manbhum, Lohardugga, and Singbhum; it is also found in Raipur. In the Deccan it is common. As regards the north-western portion of the empire, Mr. Hume writes that this species is not uncommon in Northern Guzerat, and has been shot at Mt. Aboo, being likewise pretty common in Kutch and Kattiawar, and very abundant in Sindh. It is, I conclude, found in the Punjab; but it does not appear to extend in a northerly direction into Turkestan or Kashgharia, nor do I find mention of it in Prjevalsky's 'Birds of Mongolia.' Eastwards, however, it is found permanently in the southern and central portions of China, and ranges in the summer, according to Père David, as far north as Pekin. In Japan Mr. Blakiston notes it as occurring in Yezo. Going south now we find it recorded from the Philippines by Schlegel, and in the Malay archipelago it is said to be the commonest of the white Egrets. It is there found in Java, Borneo (Sarawak), the Aru Islands, and also New Guinea. It extends to the continent of Australia, where it is the *Ardea plumifera* of Gould, being there found along the northern coasts and down the eastern shores to Victoria; thence westward it extends to South Australia. Crossing over to Africa I find that it is resident in the southern portion of the continent, breeding near the Knysna in Cape Colony; and in Transvaal it has been procured in June and September. It is recorded from Mozambique, and also from Lagos on the west coast. In North-eastern Africa Von Heuglin met with it in autumn and winter in the Kordofan swamps, and on the Blue and White Nile; but in Lower Egypt it does not appear to be found, as it is omitted from Captain Shelley's book. It is doubtfully recorded by Von Heuglin from Syria on the authority of Hemprich and Ehrenberg.

Habits.—Like the larger Egret last noticed, this species frequents paddy-fields, marshes, and flooded lands in Ceylon; but whereas the latter is generally seen singly, the present bird is usually found in small troops of four to a dozen or so. It is a shy bird, and cannot easily be approached within gunshot unless it is stalked; but in the evening, when it assembles to fly off to its roosting-place, the collector, by taking up a judicious position, may shoot it while passing over him. It roosts in trees, and during the daytime, when disturbed, perches on the very topmost branches, its snow-white plumage presenting, particularly in the northern forests, a beautiful appearance from such a position. At the borders of paddy-fields and swamps it may be seen perched on mangroves and screw-pines. It is a very silent bird. It feeds mostly on fish, and darts out its neck very rapidly on its prey. I have, however, observed it hooking food out of the water with its feet. In Sindh this species is, in common with others, captured by native fishermen partly as a decoy for other birds.

Nidification.—This Egret breeds from December until March and April. In May Layard found eggs hard-set in the heronry between Tangalle and Matura. I have found it breeding in March at the small tank (Uduwila) already mentioned; also at a tank within a few miles from Trincomalie in January, about which time it nests at other localities in that district. In December Mr. Parker has taken its eggs at Nikaweratiya tank. The trees chosen are generally of a thorny nature, growing in the water of flooded tanks; in the upper branches of these the nests, which are large stick-structures, are placed, sometimes in company with those of other species, or in a tree by themselves to the number of eight or ten. They are repaired yearly, and are flat

and about 18 inches in diameter, the lining consisting of small twigs. The eggs are three or four in number, and are regular ovals in shape, some being slightly pointed at both ends, and others more rounded, with a greater diameter. The texture is smooth, and the colour pale sea-green. Several examples in my collection measure 1·93 by 1·35, 1·78 by 1·38, 1·91 by 1·34, 1·84 by 1·32, 1·88 by 1·42, 1·93 by 1·38 inch.

In India this species breeds in July and August in the north, and in December in the south; it nests commonly in towns, according to Mr. Hume, in company with Pond- and Cattle-Herons. In writing of a colony in some old tamarind-trees in a graveyard at Etawah, he says, "On one tree we counted 198 nests, the greater number of which were occupied. On one nearly horizontal bough we counted, in a length of 21 feet, eighteen nests, all side by side on the flat surface of the bough, with barely room, in most cases, for one bird to stand between each nest, and with no room at all in some." The measurements given of the eggs are—length 1·68 to 2·08, breadth 1·32 to 1·52 inch.

HERODIAS GARZETTA.

(THE LITTLE EGRET.)

Ardea garzetta, Linn. Syst. Nat. i. p. 237 (1766); Gould, B. of Europe, iv. pl. 277 (1848); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 111; Von Heuglin, Orn. N.O.-Afr. ii. p. 1067 (1873); Hume, Nests and Eggs, iii. p. 616 (1875).

Ardea nigrirostris, J. E. Gray, Zool. Miscell. p. 19 (1831).

Ardea nigripes, Temm. Man. d'Orn. iv. p. 377 (1840).

Herodias garzetta (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 279 (1849); Jerdon, B. of Ind. iii. p. 746 (1864); Holdsw. P. Z. S. 1872, p. 477; Legge, Ibis, 1872, p. 30, et 1875, p. 403; Ramsay, Proc. Linn. Soc. Sydney (List Austr. B.), p. 23 (1877); Hume, Str. Feath. 1878 (B. of Tenass.), p. 476, et 1879 (List B. of Ind.), p. 114; David & Oustalet, Ois. de la Chine, p. 440 (1877).

Little Egret, Lath.; *La Petite Aigrette*, Cuv.; *White Heron*, *Black-billed Heron*, *Paddy-bird*, Europeans in Ceylon. *Beiadi*, Arabic (Von Heuglin); *Kilchia*, Hind. (Jerdon).

Sudu-koka, Sinhalese, lit. "White Heron." *Garça*, Portuguese.

Characteristics. *Crest, dorsal train (curved up at the end), and pectoral plumes in the breeding-season; bill black at all seasons.*

Adult male (Ceylon). Length 25·0 to 26·0 inches; wing 11·0 to 11·6; tail 4·0; tarsus 4·0 to 4·4; bare tibia 2·0; middle toe 2·7, claw 0·5; bill to gape 4·0 to 4·2, at front 3·6.—*Female.* Length 22·5 to 23·0 inches; wing 10·5 to 10·8; tarsus 3·8; pectination of middle claw deep and angulated.—*Adult.* (India, Andamans) Length 23·0 to 26·0 inches; wing 9·8 to 11·4; tarsus 3·7 to 4·5; bill at front 3·1 to 3·6 (*Hume*). (China) Wing 10·8 to 11·2 inches; tarsus 4·0 to 4·2; bill to gape 3·8 to 4·0. (N.E. Africa) Length 24·0 to 24·13 inches; wing 10·0 to 10·5; tarsus 3·84 to 4·19; bill at front 3·15 to 3·38 (*Von Heuglin*). (Europe) Wing 11·5 to 12·07 inches; tarsus 3·85 to 4·39; bill at front 3·3 to 3·7 (*Schlegel*). (S. Africa) Wing 12·0 inches (*Layard*).

Breeding-plumage (Ceylon). Iris golden yellow; loral skin and gape greenish yellow; bill entirely black; legs black: feet and lower part of tarsus greenish yellow; claws black. The tips of the toes are sometimes black, and the green ascends the tarsus less in some than in others.

Plumage entirely white; a dorsal train of decomposed feathers, with the barbs very long, and the tip of the shaft, which is as fine as the barbs, curved up and reaching about one inch beyond the tail; an occipital crest of two attenuated feathers 5 inches in length; lower neck-plumes composed of highly attenuated feathers 4½ to 5 inches in length.

An example from Amoy has the crest 6·5 inches in length.

Winter plumage. Base of the bill beneath whitish; crest and dorsal train wanting; pectoral plumes not so elongated.

The *breeding-plumage* is put on in Ceylon about October or November, and worn till about March; some examples which I have shot in January have not had the crest, and may be perhaps yearling birds.

Young. Covered as nestlings with white down, and in first plumage white, without the pectoral plumes.

Obs. Considerable difference in size exists in this Egret; but birds from all parts are clearly referable to only one species. The largest dimensions, it will be seen, are those of European and South-African birds.

H. eulophotes, Swinhoe, found in China, and ranging into Malacca and Tenasserim, is a smaller species than the present, and differs from it notably in having the bill yellow in the breeding-season and black in the winter. An Amoy

specimen before me (28th May) measures—wing 9·4 inches, tarsus 3·0, bill at front 3·05. The dorsal train reaches half an inch beyond the tail, the pectoral plumes are rather broad and 3·0 inches in length, and the crest measures 3·5 inches.

Distribution.—This handsome Egret is apparently not so widely spread in Ceylon as the last species. It is for the most part found in the northern half of the island, being common in the Jaffna district and along the east coast as far south as Batticaloa at any rate. Southward I have met with it at the tanks north and east of Hambantota. I have never shot it in the Galle district, and do not think it is to be found there except as a straggler. It is sometimes met with in the Western Province, and in the North-western is, according to Mr. Parker, not uncommon; in fact it probably occurs at all large tanks and suitable marshes &c. throughout the northern forests. Mr. Holdsworth has seen an Egret with black bill and greenish feet at Nuwara Eliya, which must be the present bird; and I have no doubt that white Egrets which occur in Dumbara include this species.

The range of this Little Egret is very wide, as it is found on both coasts of Africa, in Southern Europe, throughout Asia (as far north in the western division as the sea of Aral, and in the eastern as high up as Japan), in various islands of the Malay archipelago, and in portions of Australia.

Commencing, as usual, with India, we find that it is very abundant in Sindh and common throughout the surrounding regions, being particularly numerous in the Deesa district (*Butler*). It is commoner than the last in parts of Rajpootana, and is no doubt found in the Punjab. It is not uncommon in the North-western Provinces and in Lower Bengal, being occasionally seen in the Calcutta market, and occurring numerously in Furreedpore in the cool season, but resident in Cachar, according to Mr. Inglis. In the division of Chota Nagpur it is common, except in the western district, and is recorded by Mr. Ball from Manbhum, Lohardugga, and Orissa. In the Deccan it is plentiful; and further south it no doubt occurs at all suitable places, being probably numerous in the south-east of the Carnatic. Turning eastward, it is recorded from Thayetmyo, but not from the Irrawaddy delta, and is said to be pretty common throughout the plains of Tenasserim. Southwards it is found in Malacca, and in the Andamans is not uncommon. At Acheen Mr. Davison found it frequent about streams; and it doubtless occurs elsewhere in Sumatra. It is omitted from Salvadori's list of the birds of Borneo, but is recorded from the Moluccas and from Celebes and the Togian Islands, where Herr Meyer procured it between the months of May and August. In Australia it is found on the shores of the Gulf of Carpentaria, and down the east coast to Wide Bay. Returning to the north, I observe that it has lately been procured recently by Mr. Everett in Luzon during the month of March. It likewise inhabits Formosa and Hainan, and in the south and centre of China is resident, and in the summer is found throughout the entire empire. In Japan it is very common in the south, and likewise occurs in Yezo. In the highlands of Central Asia it does not seem to have been met with, nor does Severtzoff record it from Turkestan; it has, however, been found on the shores of the sea of Aral and the Caspian; and in Palestine Canon Tristram observed it frequently in the marshes of Huleh and about the sea of Galilee. It is recorded from Asia Minor and is also found on the shores of the Black Sea, arriving, according to Messrs. Elwes and Buckley, on the Danube in large numbers about the first week in May, and commencing then to breed, one of its colonies being on an island below Rustchuk. From Greece likewise Lindermayer records it; from Sicily Malherbe notes it; and in Malta Mr. Wright met with it. All the year round it is found in Sardinia, but is most numerous in winter (*Brooke*). In Spain it is found in suitable localities throughout the country, and is abundant, writes Mr. Saunders, in the Cotos of Doñana. In Andalucia it is not so common as other Herons (*Irby*), and in Portugal it is not very plentiful. Further north in Europe it has been recorded from Dalmatia and from Hungary; and I observe that recently Messrs Danford and Harvie Brown met with it in Transylvania.

Lastly, as regards Africa, it is not uncommon in Morocco, migrating north, according to Favier, in April and returning in September; it is also found in Algeria, is plentiful in Tripoli, and is abundant in Egypt and Nubia throughout the year; whilst in Abyssinia, as well as all along the Nile and its tributaries, Von Heuglin met with it, and in July and August observed it on the shores of the Red Sea. Further south Capt. Sperling observed it at Zanzibar and Mozambique. In South Africa it is resident, frequenting the neighbourhood of Cape Town both in winter and summer; in Damara Land and Great Namaqualand it is scarce and very local; but it is, says Mr. Andersson, pretty common on the rivers flowing into and out of Lake Ngami. Further

north it is recorded from Angola and Benguela, from the Gold Coast and Senegambia, and has likewise been shot in the Canaries. To the Azores it is also a visitor, as Mr. Du Cane Godman saw specimens when there which had been shot on the island of Terceira.

Habits.—I have generally observed this very graceful Egret in pairs or alone, and have noticed it when not breeding more about brackish lagoons and backwaters than the last species. It is often found watching for fish along the courses of streams or gutters intersecting the ooze on the shores of the salt lagoons in the north of Ceylon, and will frequently allow itself to be approached within gunshot. Its flight is, like that of most Egrets, very leisurely performed; and when on the wing, with its head drawn back and its legs stretched out, it loses the elegant appearance which it has when standing by the side of water. It wades knee deep about the tidal flats of salt lakes, and catches quantities of fish in this manner. Layard observes that he found multitudes of small aquatic shells in the stomachs of those he shot at Cape Town; but its principal food consists of fish, twenty-five of which, Von Heuglin relates, he took from the stomach of one example.

Nidification.—The breeding-time of this species in Ceylon is the same as that of other Egrets, from December until March. In the latter month I found it nesting near Tissa Maha Rama, and in December and January near Trincomalie. I have also received eggs from Mr. Parker taken at Nikaweratiya in December. It builds in company with *H. alba*, from six to a dozen nests being sometimes constructed on one large thorny tree standing in the middle of a flooded tank. They are platforms of sticks, either placed at the horizontal bifurcation of two limbs, or near the top of the tree on smaller branches. The eggs are three or four in number, moderately smooth in texture, and of the same colour as those of the last species, viz. pale sea-green; some are rather pointed at both ends. They are smaller than the eggs of *H. intermedia*. Two examples taken near Trincomalie measure 1·82 by 1·26 and 1·74 by 1·27 inch. The young perch readily on the branches near the nests before they can fly, but often fall into the water, and are invariably snapped up by the crocodiles which infest the tanks of Ceylon. Indeed I have had an old bird (winged by my shot) taken away from me (as I was wading through the water to take it from the fork of a tree in which it had perched) by one of these brutes, which, seeing the bird was wounded, jumped out of the water about two feet, seized it by the leg, and dragged it under! In India the nesting-time in the north is from July to August, and in the south December and January. Mr. Hume states that very pale bluish-white varieties are common among the eggs of this species. In India they vary from 1·6 to 1·85 inch in length, and from 1·25 to 1·38 in breadth.

Subgenus BUBULCUS*.

Bill short, rather stout, and sensibly curved near the tip; naral groove deep.

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* Scarcely separable from *Herodias* in point of structure, but differs markedly enough in habits to form a *subgenus*.

BUBULCUS COROMANDUS.

(THE CATTLE-EGRET.)

Cancroma coromanda, Bodd. Tabl. Pl. Enl. 54 (1783).
Ardea caboga, Franklin, P. Z. S. 1830–31, p. 124.
Herodias bubulcus (Sav.), *apud* Blyth, Cat. B. Mus. A. S. B. p. 280 (1849).
Ardea bubulcus (Sav.), Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 111.
Buphus coromandus (Bodd.), Jerdon, B. of Ind. iii. p. 749 (1864); Holdsw. P. Z. S. 1872, p. 477; Legge, Ibis, 1874, p. 30, et 1875, p. 276.
Bubulcus coromandus (Bodd.), Hume, Str. Feath. 1874, p. 309, et 1879 (List B. of Ind.), p. 114; Salvadori, Uccelli di Borneo, p. 350 (1874); David & Oust. Ois. de la Chine, p. 441 (1877).
Ardea coromanda (Bodd.), Hume, Nests and Eggs, iii. p. 618 (1875).
Le Crabier de Coromandel, Buff. Hist. Nat., Pl. Enl. 910; *Garde-bœuf de Coromandel*, French; *Cattle-Heron*, Europeans. *Doria bagla*, *Gai bagla*, Hind.; *Samti konga*, Telugu; *Kantal chilik*, Java; *Sweko-puti*, lit. "White Heron," Celebes (Meyer); *Huni koku*, lit. "Tick-Heron," Ceylonese Tamils.
Gehri-koka, lit. "Cattle-Heron," Sinhalese.

Adult male and female (Ceylon). Length 19·5 to 20·2 inches; wing 9·3 to 9·75; tail 3·4; tarsus 3·3 to 3·5; bare tibia 1·5; middle toe 2·4, claw (straight) 0·7; bill to gape 2·9 to 3·1, at front 2·3 to 2·45. Middle claw highly pectinated.

Adults. (Nepal) Length 19·5 to 21·7 inches; wing 9·5 to 10·5; tail 3·4 to 4·0; tarsus 3·0 to 3·5; bare tibia 1·4 to 1·8; bill from gape 2·8 to 3·1 (*Scully*). (Irrawaddy) Length 19·2 to 20·2; wing 9·3 to 9·9; tarsus 3·3 to 3·7; bill from gape 3·4 to 3·45 (*Armstrong*). (Amoy) Wing 9·5 to 10·0 inches; tail 3·2; bare tibia 1·4; tarsus 3·4; bill to gape 2·9.

Summer plumage (Ceylon). Iris pale golden yellow; bill, loral skin, and eyelid yellow; loral skin tinged with greenish; tarsi and feet black; tibia yellow; soles greenish yellow.

Feathers of the head, neck, and chest glistening reddish golden, the white bases on the throat and neck showing, but not so on the head and crest, which latter is 2 inches in length and somewhat stiff; chin white; down the centre of the fore neck a dividing white streak; upper back and lengthened "decomposed" plumes reaching nearly to the end of the tail sandy golden yellow; the upper part of the interscapular region and the lower part of the hind neck almost white; rest of the plumage white; abdomen and under tail-coverts slightly tinged with buff.

Both pectoral and flank "powder-down tracts" are highly developed in this Egret; they are white, buff at the base.

Non-breeding plumage (Ceylon). Iris, bill, and legs as in summer dress, except that the hue of the bill is not so bright and the tibiæ are black.

Entire plumage white; a slight wash of golden buff on the crown and lower part of the fore neck; the back also tinged with buff; occipital feathers not lengthened, and the dorsal train wanting. The amount of buff on the forehead and neck is variable in individuals.

Young. Covered with "long, coarse, golden-yellow and hair-like feathers" (*Meyer*).

Obs. The yellow summer plumage appears to be more highly developed in some individuals than in others. An example from Amoy, before me, has the golden yellow descending over the breast; other specimens are similar to the one above described, and a Sumatran example is identical with Ceylonese skins.

A near ally of this species is the African Cattle-Egret, *B. russata*, Wagler (*Ardea ibis*, Hasselq.), a well-known bird in Egypt, and extending into parts of South-west Asia. It differs from our bird in the much paler or less golden colour of the head and neck in summer plumage, and in the more feathered tibia. The wing measurement, according to Von Heuglin, is 8 inches 10 lines (8·84) to 9 inches 3 lines (9·25), bare tibia 1·0.

Distribution.—This well-known Heron is spread throughout all the low country of Ceylon, being quite the most abundant of the white Egrets of the island. It is particularly common all through the Western Province, the more open parts of the North-western Province, and similar districts in the well-watered and cultivated parts of the south. It is found in suitable places throughout the south-eastern districts both on the sea-board and in the interior; but it was omitted accidentally from my list of the birds of this region in the 'Ibis' for 1875. In the Eastern Province and in the neighbourhood of Trincomalie it is, I think, not so numerous as in the west of the island. Further north it is perhaps more plentiful, and I have always met with it at tanks, village pools, and open tracts of country in which there was water all through the northern forests. It ascends into the valleys of the Kandy country, and is occasionally, I understand, seen in the Fort-Macdonald district; but I do not know that it has ever been noticed at Nuwara Eliya.

It is very common all throughout India, being found at the base of the southern hills, in the Deccan, and all throughout the north-western region, composed of Sindh, Rajpootana, Guzerat, Kutch, and Kattiawar, frequenting those districts which are well watered; it is found in the Central Provinces and all through Chota Nagpur and in the districts at the foot of the Rajmehal hills; about Calcutta it is tolerably plentiful, and in Furreedpore is common. In these parts, as far as published data go to prove, it is more or less resident, collecting in certain localities to breed. It is a permanent resident also in the valley of Nepal, being common there from the beginning of March until the end of November; in the Terai and adjoining places it is abundant in December (*Scully*). In Upper Pegu it is common at Thayetmyo; but in the intermediate district of Cachar I find no mention of its occurrence. In the Irrawaddy delta Dr. Armstrong found it very abundant; and further south, in Tenasserim, Mr. Hume says it is plentiful everywhere, especially where there are cattle. In the Andamans it is common, but was not observed by Mr. Davison in the Nicobars, though he met with it in Sumatra at Acheen. To the eastward of Burmah it ranges into Cochin China and the south of China, as also to the island of Formosa in the summer. In the Celestial Empire, according to Père David, it extends only as far north as the river Yang-tze-kiang. It has been recorded from Luzon in the Philippines; and in the Malay archipelago it inhabits Java, Borneo (Sarawak, Brunei), Timor, Batchian, and Celebes, in the latter of which islands it appears to be numerous.

Habits.—This Egret frequents pasture-land, paddy-fields, the borders of tanks, and edges of swamps; and from its great abundance and singular habit of attending on cattle and frequently perching on their backs is familiar to all Europeans who reside in or have visited Ceylon. In the Western Province it is the one bird that, wander where one will in the cultivated districts, one is sure to meet with. Along the railway from Colombo to Rambukkana it is sure to be seen (except during the months when it has retired to secluded spots to breed), standing sometimes two or three in a field, attending one or two oxen, or grouped in a little flock near a pond in which several unwieldy buffaloes are half immersed, taking a noonday siesta. On their broad backs probably stand one or two Egrets, like sentinels on watch-towers, their presence being regarded by the buffaloes with complacence and evident satisfaction, for the attractions of the birds are the quantity of flies and insects which tease the animals, and the ticks which infest their skins, on both of which these Egrets largely subsist. The Cattle-Egret is a graceful bird when in an attitude of repose, standing with its neck curved, and its body, which is proportionate to the moderate length of its legs, presenting a graceful outline against the green fields. It perches much on trees, and at evening time collects in flocks, which fly moderately close together, and proceed with steady and rather slow strokes, on their way over the surrounding jungle to some common roosting-place. It roosts in trees, and is abroad very early in the morning, flying away at once to far-distant feeding-grounds. This bird feeds on grasshoppers, beetles, bugs (*Hemiptera*), locusts, and flies, also on frogs and crustacea, but rarely, I think, on fish; it may sometimes be seen following native cultivators when they are hoeing the fields, its snow-white plumage contrasting beautifully with the dark soil. With regard to its partiality to grasshoppers, Mr. Ball writes:—"One which I shot early in the day on the 24th of March, 1867, contained in

its stomach 60 whole grasshoppers and other orthopterous insects, besides which there was an equal bulk of some digested heads and legs, so that this bird had breakfasted on about 120 grasshoppers." I have on more than one occasion seen this Egret picking ticks from the legs of cattle; but I have not observed it doing so when standing on their backs, as Crows commonly do; and this latter position seems to be one of rest merely. It is an extremely silent bird as a rule; but during the breeding-season it becomes noisy, and constantly utters its cry (*quak*), which is perhaps peculiar to it when nesting.

Nidification.—Layard found this Egret breeding with the larger species in May at a tank near Tangalle. The nests are commenced or renewed about the beginning of April, and probably earlier in localities where these large colonies commence at the beginning of the year to breed. At the several heronries which I have visited I have not had the good fortune to find the Cattle-Egret nesting, and I rather incline to the opinion that it nests by itself as a rule. The nests are built on trees in the water, and are platforms of sticks lined with a few roots or creeper-tendrils. The eggs are four or five in number, and are, says Mr. Hume, to be distinguished from those of all other Herons by their very pale colour, being white, with a faint green tinge. They are broad ovals in shape. In length they vary from 1·6 to 1·85 inch, and in breadth from 1·22 to 1·4.

The breeding-season in North India lasts from June until August; but in Southern India it is in November and December.

Genus ARDEOLA.

Bill stout at the base, much pointed, the gonys pronounced, commissure nearly straight. Wing with the 1st quill almost equal to the 2nd, which is the longest. Tail very short. Legs short; tibia feathered more than in the preceding groups. Tarsal scales narrow and rectangular. Middle toe slightly shorter than the tarsus; inner toe slightly shorter than the outer; hind toe stout.

Plumage of the neck elongated; head crested and dorsal plumes decomposed and elongated in the breeding-season, also a marked difference in the plumage at that time.

ARDEOLA GRAYI.

(THE POND-HERON.)

Ardea grayii, Sykes, P. Z. S. 1832, p. 158.

Ardeola leucoptera (Bodd.), Blyth, Cat. B. Mus. A. S. B. p. 281 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 112; Jerdon, B. of Ind. iii. p. 751 (1864); Legge, Ibis, 1874, p. 30.

Ardeola grayi (Sykes), Holdsw. P. Z. S. 1872, p. 478; Hume, Nests and Eggs, iii. p. 619 (1875); Legge, Ibis, 1875, p. 276; Hume, Str. Feath. 1876, p. 467, et 1879, p. 114 (List B. of Ind.); Scully, *t. c.* p. 361.

Indian Squacco Heron, *Marone-backed Heron*, Sykes; *Paddy-bird*, Europeans in India and Ceylon. *Andhe bagla*, *Kani bagla*, Hind.; *Konch bogla*, Beng.; *Gudi konga*, Telugu, lit. "Blind Heron;" *Nuli madiyan*, Tamul, lit. "Blind idiot."

Kana-koka, Sinhalese.

Adult male and female (Ceylon). Length 18·0 to 18·5 inches; wing 7·75 to 8·3; tail 2·75 to 3·2; tarsus 2·05 to 2·1; middle toe 1·85 to 2·0, its claw 0·45; hind toe 0·9 to 1·0; bill to gape 2·9 to 3·0, at front 2·3. Pectination of the middle claw fine and shallow.—*Male* (Irrawaddy). Length 15·2; wing 8·65; tail from vent 2·9; tarsus 2·3; bill from gape 3·2.—*Females*. Length 14·25 to 14·6; wing 7·55 to 7·6; tarsus 1·9 to 2·2; bill from gape 3·1 to 3·15 (*Armstrong*). [The "length" in these cases appears to be given exclusive of the bill.]—*Adults* (Nepal). Length 17·5 to 20·7; wing 7·5 to 8·7; tail 2·8 to 3·1; bill from gape 2·93 to 3·2 (*Scully*).

Breeding-plumage. Iris golden yellow; bill with the terminal portion black, bluish at the base and on the culmen; sides of both mandibles at the middle yellow; legs and feet greenish, the tarsus pervaded with grey and the joints bluish.

Head and neck greyish yellow, the long decomposed feathers at the lower part of neck whitish, and their bases brownish grey; head tinged with ashy; an occipital crest of narrow white feathers, attaining a length of 4½ inches; upper part of back and long decomposed scapular feathers dark maroon, with an ashy hue in parts; rest of the plumage white. Some specimens have the head more ashy than others; and the occipital crest varies in length. The dorsal plumes reach beyond the tail.

Non-breeding dress. Bill with the upper mandible, gape, and tip of lower blackish, lower mandible yellowish; legs and feet greenish yellow; loral skin yellow.

Head and upper part of the hind neck, as also two broad lateral stripes on the fore neck, black-brown, with golden-yellow central streaks, increasing in width on the lower part of the hind neck, leaving the margins of the feathers paler brown; crest wanting; face and ear-coverts golden buff, striped with brown; chin and gorge pure white, with a stripe on each side of the chin; upper back, scapulars, and terminal half of tertials glossy cinereous brown; a yellowish streak down the centres of the scapulars, but some of the underlying feathers pure white; wings, lower back, rump, tail, and under surface white; the greater wing-coverts washed with brownish buff; lower fore-neck feathers white at the base and centres, passing into buff near the tips, near which are lateral stripes of brown, paler than those on the upper fore neck.

Young. In nestling plumage the iris is yellow, bill fleshy red, and the legs and feet pea-green. The plumage much resembles the non-breeding dress of the adult: head not so dark, the striæ more fulvous; sides of the neck buff, the feathers brownish at the sides; fore neck and throat white, with drop-shaped marks of brown; brown of the scapulars and back more rufescent than in the adult; wing-coverts buff, washed with brownish; quills and tail tipped with the same, increasing on the outer primaries, the first of which is all brown, except on the basal half of the inner webs.

Obs. Specimens in winter plumage from Futtehghur correspond with mine from Ceylon, except that the dark stripes on the fore neck are somewhat tinged with vinous; this may be an individual peculiarity, and the bird is so scarce

in English collections (though so abundant in India) that I have not had an opportunity of comparing many Indian specimens. A *male* measures—wing 8·4, tarsus 2·3, middle toe (with claw) 2·4, bill to gape 3·0 inches. In Bengal the breeding-plumage is acquired in May and worn until October (*Cripps*).

Ardeola prasinoscelis, Swinhoe (which is perhaps the same as *leucoptera**, Bodd.), inhabiting China and also the Malay peninsula and Tenasserim, is the Eastern representative of the present species. It has, in breeding-plumage, the head and neck deep chestnut, darkening into cinnamon-rufous on the chest; the interscapulary region and dorsal plumes blackish slate, the scapulars washed with golden; throat and rest of plumage white. A Chinese specimen measures—wing 9·2 inches, tarsus 2·5, bill to gape 3·2; in *non-breeding plumage*, according to Mr. Hume, it resembles *A. grayi*, except that occasionally it has a crest of buff feathers with black edges, and it may always be distinguished by its stouter bill. Legs and feet orange-yellow, with a pinkish tinge.

Another species, *A. speciosa*, inhabiting the Malay archipelago, is allied to the last-mentioned, having the dark parts of the plumage in the breeding-season ferruginous of various shades and purplish black with a hoary shade, the latter being the colour of the back. It is a smaller bird than the latter, an example from Celebes measuring, according to Mr. Hume—wing 7·7, tarsus 2·35, bill at front 2·5. A further species of Squacco Heron is *A. comata* from Egypt, which has the crest white with black edges, head and neck brownish buff, and the back yellowish brown, shaded with purple; legs olive: wing 8·5 (*Shelley*).

Distribution.—This Heron is extraordinarily abundant in Ceylon, being found at every pool, river, and stream, and in all paddy-fields in the cultivated districts of the low country, and by both large and village tanks and at most water-holes in the forest-districts of the island. In the western and southern parts, where paddy-cultivation abounds, it is, of course, most numerous, extending in the Western Province to the base of the hills and up into the valleys of the Kandyan country, wherever the "terraced" fields of the natives adorn the sides of the mountains. It is found about Badulla, and, I believe, is sometimes seen in the Fort-Macdonald district; it likewise affects paddy-fields about the base of the southern hills and ascends into their valleys.

In India it is, as in Ceylon, extremely numerous, being, as Jerdon says, found at the side of every river, tank, ditch, and pool throughout the country. Consulting the writings of recent observers in 'Stray Feathers,' I find it recorded as common everywhere in Southern Travancore (*Bourdillon*), also about the base of the Palanis (*Fairbank*), throughout the Deccan, where it was first described from by Sykes, common in all parts of Chota Nagpur, and recorded by Mr. Ball, as regards this region, from Bardwan, Manbhum, Lohardugga, Orissa, Nowagarh, and Karial. In the North-west Provinces it is equally plentiful, and further west is found in Rajpootana, including the State of Jodhpur (where it clings to the pools in the severest droughts as long as the water lasts), and in Guzerat, Sindh, Kutch, and Kattiawar. At the Sambhur Lake, Mr. Adam found it not very plentiful. Turning eastwards again, we find it abundant in Furreedpore, also in Cachar, and common in Upper Pegu at Thayetmyo; further south Dr. Armstrong met with it throughout the Irrawaddy delta in all suitable places, and over all the low country of the Province of Tenasserim it is equally plentifully distributed. Beyond this region towards Malacca it is entirely replaced by *A. prasinoscelis*. Leaving the mainland I find that it is recorded by Mr. Davison as common at Pt. Blair; but he believes it to be migratory to the Andamans. Mr. Hume observed it at Barren Island; but at the Nicobars it has not been noticed. Westward of India Mr. Hume met with it at the Laccadives, observing it numerously at Cardamum and Amini.

Habits.—As above remarked, this Pond-Heron frequents all kinds of freshwater situations, from the little pond in the native compound, or secluded water-hole in the dry timber-forest or arid maritime scrubs, to the extensive tank or wide-spreading paddy-field. It, however, does not despise salt-water fish; and solitary examples may frequently be seen in the sardine-season perched on stones and rocks, even at some little distance from the shore, where the water is calm: two birds were always to be seen in such situations along the coast of the Fort at Trincomalie, and when tired with watching at one rock (they never used to catch much in these places) they would fly leisurely on to another. At night the little colony which frequented the

* This name was applied to Buffon's figure (Pl. Enl. 911) of a young bird; and as the young of the Indian and Chinese species are alike, it is not possible to say with certainty which of the two Buffon intended to portray.

vicinity of the fort roosted in the trees in the "Gun Park," retiring some time before dark, and perching tamely on the branches close to the road. It is proverbial in India for its tameness; and it manifests an equally confiding disposition in Ceylon, forbearing to fly up until approached very close, and then merely shifting its ground but slightly, or alighting on a fence, stump, or branch of a tree close at hand. Its tame disposition has earned for it in India the opprobrious names mentioned in the synonymy; but in Ceylon its Sinhalese name has reference only to its flesh, which the natives consider good eating. When watching motionless by a pool, often standing up to its knees among grass, with its head drawn in, its brown back towards the spectator, and its white wings concealed, it is astonishing how very unobservable it is; but the instant it spreads out its wings to take flight, an attractive white bird catches the eye with almost startling effect, owing to its previous invisibility. The Tamuls, according to Layard, have a proverb that, like this Heron, the deceitful man only occasionally shows himself in his true colours. When startled suddenly it rises with a short hoarse *ko-ake*, which is almost the only note one ever hears, except at the breeding-time. It rarely perches on lofty trees, preferring stumps, branches of fallen trees near water, stakes, and fences; and, except when going off to roost, it rarely takes long flights; the movements of its wings consist of quick flaps, unlike that of other Herons. Frogs are its favourite food; but it likewise catches water-beetles, crabs, and fish, moderately large examples of which I have taken from the stomach of one shot on the Colombo Lake.

Nidification.—The Paddy-bird breeds in May and June in the south of the island; it retires to unfrequented localities to nest, sometimes to an island in a lake. In such a situation on the Kogalla Lake, near Galle, I once found a large colony of Pond-Herons breeding in a grove of Kadool trees (*Rhizophora mucronata*) with which the islet was girt. The nests were built in the forks of branches, and were platforms of sticks and twigs without any lining, measuring from 8 inches to a foot in diameter. In some trees there were as many as five or six nests. The eggs were from two to four in number; but the average number in a clutch was four; they varied in shape, some being equally rounded at both ends, others somewhat pointed at the small end. The colour is pale bluish green, and the average size of a number of specimens is 1·57 by 1·18 inch. Many nests contained young; but, singular to say, only one; and what had become of the others I cannot say. They scrambled out of the nests and crawled along the branches with considerable agility, holding on with their claws when seized.

In Upper India, writes Mr. Hume, this species breeds in July and August, but in the south in December. Mr. Oates says that in Burmah, occasionally, it apparently nests in reeds.

Genus BUTORIDES.

Bill quite straight, the terminal portion acute; under mandible markedly slender, but with the gonys pronounced. Wings pointed, the 1st and 2nd quills subequal and longest; tertials equal to the primaries. Tibia more feathered than in the last. Tarsus short; tarsal scales transverse, but polygonal or angulated at the sides. Toes short.

Head crested; plumage of the neck elongated; scapulars lanceolate and not decomposed. No change of plumage in the breeding-season. Of semi-nocturnal habit.

BUTORIDES JAVANICA.

(THE GREEN BITTERN.)

Ardea javanica, Horsf. Trans. Linn. Soc. xiii. p. 190 (1821).

Butorides javanica (Horsf.), Blyth, Cat. B. Mus. A. S. B. p. 281 (1849); Jerdon, B. of Ind. iii. p. 752 (1864); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 113; Holdsw. P. Z. S. 1872, p. 478; Hume, Str. Feath. 1874, p. 310, et 1879, p. 114 (List B. of Ind.); Salvadori, Uccelli di Born. p. 351 (1874); Legge, Ibis, 1875, p. 404; Hume, Nests and Eggs, iii. p. 620 (1875); David & Oust. Ois. de la Chine, p. 442 (1877).

Javanese Heron. Burong Jukoyan, Borneo; *Puchong*, Malay; *Burong Puchong*, Java (Horsf.); *Kancha bagla*, Hind.; *Kana bogla*, Bengal.; *Doshi-koku*, Tamil; *Sweko-itam*, lit. "Black Heron," Celebes (Meyer).

Adult male and female. (Ceylon) Length 16·75 to 17·5 inches; wing 6·7 to 6·9; tail 2·2 to 2·4; tarsus 1·75 to 1·9: middle toe 1·8, claw (straight) 0·4; bill to gape 2·9 to 3·1, at front 2·3 to 2·4: pectinations of middle claw deep and fine.—*Male* (Andamans). Length 16·75; wing 6·75; tail 2·5; tarsus 3·0; bill from gape 3·1, at front 2·45: weight about 6 oz. (*Hume*).—*Males* (Furreedpore). Wing 6·75 to 7·0; tarsus 1·83 to 2·0; bill from gape 3·35 to 3·43.—*Female.* Wing 6·75; bill from gape 3·58: weight 6·62 oz. (*Cripps*).—*Adult* (China). Wing 7·2; tarsus 1·9; bill at front 2·5.—*Male* (Borneo). Wing 7·0; bill at front 2·3.—*Adult* (Java). Wing 6·7; bill at front 2·4.

Iris yellow or reddish yellow, with a brown outer circle; bill, upper mandible and edge of lower black, lower mandible greenish; loral and orbital region greenish yellow; legs and feet dull green anteriorly, posteriorly and the soles yellow, claws brown.

Top of the head, crest ($2\frac{1}{2}$ in. long), and a facial patch, divided and bounded beneath by buff-white stripes, black, glossed (except on the cheeks) with green; back and sides of neck, passing below the cheek to the under mandible, dusky bluish ashy, tinged with brownish and shaded at the shoulders with reddish ashy; back cinereous, tinged with metallic green and pervaded with reddish ashy on the rump; scapulars, wing-coverts, and tail metallic green, pervaded with slaty on the tail and pale grey (in some lights) on the elongated scapulars; least wing-coverts margined with rufous-brown; the succeeding rows and the tertials with clearly defined edges of fulvous yellow; quills slate-colour, tipped, except the outer primaries, with white; chin and centre of fore neck white, interrupted at the middle of the throat and washed on the lower part with pale fulvous or reddish brownish, the feathers on the upper part having brownish tips; beneath slaty, washed with brownish fulvous on the belly and thigh-coverts; under tail-coverts with dark subterminal patches; axillaries and under wing slate-grey; the edge beneath the metacarpus buffy white. The powder-down tracts in this species are extensive.

Very old birds are said by Mr. Hume to have no pale margins to any of the wing-feathers, which are rich metallic green; there is no white stripe down the centre of the throat, and the underparts have a stronger reddish tinge than in ordinary adults.

Young. Birds of the year have the soft parts much as in the adult.

Head and crest ashy black, slightly glossed with green, and with white mesial stripes; hind neck and its sides, with the back, brownish ashy, the sides of the neck with broad whitish mesial stripes; wings and tail dingy metallic green, the scapulars and wing-coverts with triangular terminal white spots, the coverts with broader but not so sharply defined edgings as in the adult; scapulars not lanceolate; quills dusky slaty, with terminal white spots expanding into an edging on the tip of the outer web; cheeks blackish, striated with whitish, the lower cheek-stripe whiter than in the adult, and the sides of the gorge striated; chin, centre of throat, and fore neck with the breast and belly white, the middle of the fore neck with deep brown, and the lower part with lighter brown *lateral* patches to the feathers; sides of the chest dashed with light brown, the tips of the feathers buff-white.

Birds not fully adult may be known by having the centre of the throat dashed with dark brown, the black cheek-patch not clearly defined, the sides of the chin black, and the *least* wing-coverts more conspicuously edged than in the normal stage. This is probably the phase of the second year.

Obs. Chinese specimens have the dorsal plumes paler or more ashy than in mine from Ceylon; and the margins of all that I have examined are pure white. Adolescent examples from Java exhibit the same characters, as regards stripe down the throat and black streak on each side of the chin, as I have above noticed are present in Ceylonese. The Chinese race seems to be larger than the Indian; but published data and the measurements of specimens I have seen from Java, Andamans, India, and Ceylon correspond pretty well with one another.

B. macrorhyncha, Gould, from China and Australia, appears to resemble our bird, but is longer in wing and bill. A specimen which I have examined in the Swinhoe collection, measuring in the wing 8·2 inches, is apparently of this species.

Distribution.—This handsome little Bittern is abundant in the north and east of the island, and is likewise numerous on the west coast, in the cool season particularly. At that time I have frequently met with it on the Colombo Lake and lurking about the banks of various streams between Negombo and Galle. Throughout the year it is to be met with near Kotte and similar places on the west coast; but, as a rule, it is not often seen after April in that part of the island. It is to be found in the south-eastern region in suitable places, and on the margins of the Batticaloa Lake it is common, and, I imagine, resident throughout the year. In the Trincomalie district I noticed it more frequently during the north-east monsoon than between April and October. On the coast to the north of that place it is common about salt lakes or lagoons which are lined with low trees and bushes growing between high- and low-water marks. At Jaffna Layard speaks of it as being abundant. It is found throughout the year at Aripu, according to Mr. Holdsworth; and at tanks in the North-central and North-western Provinces Mr. Parker has met with it.

In India it appears, from published data, to be more generally distributed than the Cinnamon or Black Bitterns. I find Mr. Bourdillon recording it from the Travancore hills as a winter visitor, affecting mountain-streams up to 2000 feet, Messrs. Davidson and Wenden writing that it is common at Satara, and Mr. Fairbank that it is found at Mahabaleshwar and in the hills west of the Deccan. It is commonly distributed throughout Sindh, Guzerat, Kutch, Kattiawar, and portions of Rajpootana, wherever there are tanks, marshes, and canals. On the Eastern Narra it has been found breeding; and near Kurrachee harbour Capt. Butler has met with it. From the districts thus mentioned across to Calcutta it is pretty generally distributed, and in Chota Nagpur and some parts of the central provinces it is common, according to Mr. Ball. In Furreedpore and North-east Cachar the same is the case; but in the immediate vicinity of Calcutta it is rare. In Upper Pegu Mr. Oates found it on the Engmah swamps; and further south in Tenasserim it is to be met with, says Mr. Hume, on every stream. It has been procured at Malacca; and in the Andamans and Nicobars it is very common, breeding there, according to Mr. Davison, in May. It likewise occurs at the Laccadives, where Mr. Hume met with it on the island of Cardamum. Turning eastward now we find it extending to Cochin China and the south of China in the summer for breeding purposes; and, according to Messrs. David and Oustalet, it ranges north to Mantchura, Amoor Land, and Japan; but it seems doubtful whether it is this species or the larger-billed form, *B. macrorhyncha*, which is found in these northern regions. Schrenk gives the wing of an Amoor-river example as 7·5 inches, which would appear to refer to our bird. In the Philippines the present species has recently been found in Luzon; and it is distributed throughout many of the Malay islands from Borneo to Sumatra, in which latter island it occurs at Acheen in the extreme west and in Lampong at the eastern extremity. From Java it was first described by Horsfield; and in Borneo it has been procured at Banjermassing, in Sarawak, at Sibu, and in the adjacent island of Labuan; from Amboyna, Celebes, Ceram, Halmahera, Morotai, Timor, Flores, Aru Islands, and New Guinea it has been recorded; and I observe from Herr Meyer's notes that it is not uncommon in Celebes, breeding there. Along the northern sea-board of Australia from Port Darwin it is found as far south as New South Wales; and eastward it extends to New Caledonia, the Society Islands, and Fiji.

Habits.—This Bittern is not by any means wholly nocturnal, as on dull days it may be seen out feeding in exposed situations; and wherever there are overhanging bushes on the banks of rivers or the borders of lakes it may constantly be seen lurking about, watching, in a lethargic sort of manner, for fish and frogs. It will stand for a long time in an attitude of repose, with its neck drawn in, now and then twisting its head awry when any thing attracts its attention; then perhaps stalking along with measured steps, thrusting its head out, gazing into the water with apparent stupidity until its sharp eye catches sight of a fish or frog,

which is instantly pierced with an unerring aim and quickness of action that the beholder would never have thought it capable of. I have seen it standing early in the afternoon by the water of the Batticaloa Lake, within five yards of the highroad, with an air of the most utter preoccupation, quite regardless of the passing vehicles and seemingly of any thing else in this world; but beneath this cloak of apathy lurks a watchful spirit; and a keen eye, though it cannot be observed, is surveying the finny prospect around it! At sundown it becomes active and flies about, seeking hunting-grounds for the night. Herr Meyer, who observed it at the Lake of Tondano, Celebes, says it "sits much on a twig over or near water, bent together, but eagerly looking for food and suddenly rushing down on a fish or crab;" he also remarks that it feeds on eggs of freshwater fishes, especially of *Ophiocephalus striatus*, which strong fish often attacks the bird and hinders it from devouring the eggs (!). This writer likens the call to *qua qua*, like that of a Crow. Occasionally this Bittern may be seen on the seashore; and Captain Wade-Dalton informs me that he shot one on the rocks near the Galle lighthouse.

Nidification.—The Green Bittern breeds in India from May until August. In May its nest has been found in Sindh; in July on the Jumna canal; in August in the Etawah and Muttra districts. I am not aware that its eggs have ever been found in Ceylon; but, judging by the young birds being about in first plumage at the end of the year, the breeding-time must be similar to that in India. The nest is usually placed near the water among reeds and rushes, or on vegetation growing in water. One which Mr. Hume found "was partly supported on the twigs of a dead sunken Babool branch, and partly on rushes bent down over this, forming a little platform about 2 feet above the water's edge. It was a small stick-nest, perhaps 8 inches in diameter." Captain G. Marshall found a nest on a Keekur-tree at the edge of a jheel, on a horizontal branch about 20 feet from the ground, and describes it as a slight structure of sticks.

The eggs are three in number, elongated ovals, pointed at both ends; greenish white, and vary in length from "1·59 to 1·64 inch, and in breadth from 1·19 to 1·23." The nest which Captain Marshall found contained three young ones, which were nearly fledged but unable to fly, and crept about among the thorny branches.

Genus ARDETTA.

Bill much as in *Butorides*, deeper at the base, and with the culmen flat at the forehead; gonys short; naral groove capacious. Legs short; tibia feathered down to the knee; tarsus scarcely longer than the middle toe and claw.

Head with a short crest; neck-feathers elongated; back of the neck bare; scapulars normal.

Of nocturnal habit.

ARDETTA SINENSIS.

(THE EASTERN LITTLE BITTERN.)

Ardea sinensis, Gm. Syst. Nat. i. p. 642 (1788); Gray & Hardwicke, Ill. Ind. Zool. i. pl. 66. fig. 2 (1830-34); Salvadori, Uccelli di Born. p. 354 (1874); Hume, Nests and Eggs, iii. p. 673 (1875).

Ardea lepida, Horsf. Trans. Linn. Soc. xiii. p. 90 (1821).

Ardetta sinensis (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 282 (1849); Layard & Kelaart, Prodromus, Cat. App. p. 61 (1853); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 113; Jerdon, B. of Ind. iii. p. 755 (1864); Holdsw. P. Z. S. 1872, p. 478; Legge, Ibis, 1875, p. 404; David & Oustalet, Ois. de la Chine, p. 448 (1877); Hume, Str. Feath. 1879, p. 114 (List B. of Ind.); Doig, *t. c.* p. 378.

Chinese Heron, Lath.; *Yellow Bittern*, Jerdon. *Jun bogla*, Bengal.; *Bambangan*, Java (Horsf.); *Mannal Nary*, Ceylonese Tamils.

Metti korowaka, Sinhalese.

Adult male and female (Ceylon). Length 14·4 to 14·75 inches; wing 5·2 to 5·4; tail 1·8 to 1·9; middle toe and claw 1·95 to 2·0; bill to gape 2·4 to 2·9, at front 2·0 to 2·2; expanse 21·0. Middle claw finely pectinated.

Male (Furreedpore). Length 17·75 inches; wing 5·53; bill at front 2·16; weight 3·37 oz. (*Cripps*).—*Female* (Andamans). Length 15·25 inches; wing 5·3; bill from gape 2·75; weight 6 oz. (*Hume*).—*Five males* (China). Wing 5·1 to 5·3 inches; tarsus 1·7 to 1·9; bill at front 2·05 to 2·2. *Three females.* Wing 4·7 to 4·9 inches; bill at front 2·0 to 2·1.—*Female* (Flores). Wing 4·8 inches; bill at front 2·05.

Iris golden yellow; orbital and loral skin and gape greenish, with a dark line above to the nostril; bill, culmen blackish brown, the margin of upper mandible and the lower yellowish; legs yellowish, marked with green on the joints and sides of tarsus; feet greenish dusky above; claws dark brown.

(Ceylon). Forehead, head, and crest black, with a green lustre; neck and throat light fulvous yellow, the chin paler, and the sides of the neck, face, and sides of head shading off into reddish cinnamon-colour, deepest at the tips of the elongated feathers; back and scapulars pale glossy brown, with a slight green lustre and a dark wash down the centre; wing-coverts sandy or paler brown than the back; quills, primary-coverts, winglet, and tail blackish slate; upper tail-coverts bluish ashy; pectoral plumes black, with broad fulvous-yellow edgings; breast, belly, and under tail-coverts fulvous white, darkening to fulvous at the sides of the breast and on the flanks; under wing-coverts and edge of wing white.

Young. Birds of the year have the soft parts as in the adult.

Centres of the head and crest-feathers black, changing to rufous at the edges; chin and gorge white; a rufous stripe down the centre, this colour spreading over the neck on the lower part, and occupying the centres of the feathers, which are dark-shafted; terminal portion of side-neck feathers the same; back rich brown, verging into rufous on the scapulars and tertials; centres of the wing-coverts brown, and the whole deeply edged with glossy fulvescent yellow; quills, tail, and pectoral plumes much as in the adult, but the latter with broader edgings, and the hue of the primaries and secondaries not so black; the edge of the 1st quill buff, and the tips of the secondaries slightly pale.

Obs. Examples from the Andamans and Nicobars are, according to Mr. Hume, more brightly plumaged than Indian specimens. A young bird is described (Str. Feath. 1873, p. 308) as having the top of the head, back, scapulars, tertials, and lesser wing-coverts "deep cinnamon-rufous," the crown-feathers centred darker, and the margins of the back-feathers golden buff. This distribution of colour is the same as in our birds; but the tints are evidently brighter both as regards the dark and pale coloration. A series of adults from China which I have examined present no important points of difference; the colour of the back is a little browner in most, but in other points they are identical with Ceylonese birds. The well-known Little Bittern of Europe, which is also found in North-western India (Sindh), is the western representative of this species, and is larger, differing chiefly,

as regards plumage, in the colour of the back and scapulars, which is black. The head and crest are likewise black, as in our bird; throat and under surface buff. An adult before me measures—wing 5·5 inches; bill (which is proportionately shorter than in *A. sinensis*) 1·85 at front. An immature male measures 6·0 inches in the wing; bill at front 1·7.

Distribution.—This species, like the Black Bittern, is chiefly found in the damp and better watered portions of the island, rarely occurring, so far as I know, in the dry districts of the Eastern Province, and only affecting a few suitable localities in the north. From November until March it is common in the Western Province, inhabiting parts of the Colombo Lake, resorting to the "Lotus-pond" even, affecting the swamps and bushy morasses between Borella and Kotte, similar spots in the Mutturajawella swamp, scrubby islands in the Negombo Lake, reed-beds on the Panadure and Bolgodde Lakes, and similar localities along the whole western sea-board. It is occasionally seen among bushes on the rivers and streams of this part of the island and the extreme south. Here it is to be found on the Bentota, Gindurah, and Matara rivers, and further east perhaps on the Wellaway river. Near Tissa Maha Rama I have met with it, as also on the Batticaloa Lake; but in this part of the island it is, as I have remarked, apparently rare. During the south-west monsoon it disappears from the neighbourhood round Colombo, retiring probably to secluded spots for breeding purposes. Mr. Parker has seen it in the Kurunegala district, and also at Nuwara wewa and other tanks near Anaradhapura; and I have no doubt it breeds there. I have seen it near Trincomalie and in the Jaffna peninsula on the Ethelemaduvil swamp, which forms the head of the Pootoor lagoon, and is one vast bed of reeds intermingled with groves of bushes and mangroves.

In India it is found here and there throughout the peninsula, as also in the northern parts of the empire; but it does not seem to be regularly distributed. In the Deccan Messrs. Davidson and Wenden say that it is not common; and it is not included in Mr. Ball's list of Godaveri and Ganges birds. About Calcutta and in Furreedpore it is rare; likewise in Pegu, as I find that Mr. Oates met with it but once; in Tenasserim, however, it is not uncommon to the north-west of the Sittang and in the southern half of the province. Turning to the north-west of India I find that it is a bird of irregular occurrence in Guzerat and Sindh, although very common during some seasons on the Eastern Narra, where Mr. Doig found it breeding. In this part of India the ranges of the two species of small Bittern overstep, that of *A. minuta* extending thence westwards to Europe. Turning now towards the east, we find *A. sinensis* common throughout China in the summer, breeding in great numbers near Pekin, according to Père David; a straggler to Japan, whence Mr. Blakiston has sent it to England; also to the Philippines, where Schlegel records it as occurring; rare in Formosa; and finally ranging from Sumatra and Java to Borneo, Celebes, and Flores. In the first-named island it was seen at Acheen by Mr. Davison; and in Borneo it has been procured in various localities, and among others at Bintulu in October by Mr. Everett. It is said to have been found in the Ladrone Islands, which, I conclude, must be the limit of its range to the eastward.

Habits.—This pretty little Bittern, which is the smallest of its family in India and Ceylon, affects long grass in swamps, reeds, bulrushes, and also thickets growing in marshes and morasses. It is very partial to long reeds, on which it perches quite as adroitly as a Warbler. I have seen it suddenly alight on a tall perpendicular reed-stalk, with one leg stretched down and the other abreast of the body, in exactly the same manner as an ordinary Passerine bird. It is by no means shy, and does not fly up until it is approached quite close, often preferring to seek concealment by skulking in underwood and scrub rather than by taking flight. It is very difficult to flush once it has taken to dense cover, running about on the ground, or creeping and climbing about the branches. It is much more diurnal than the Black Bittern, and on the islands in the Negombo Lake, some of which are clothed with thick, low, flat-lying brushwood, I have seen it come out to the edge of the salt water and watch for shrimps and small fish, standing motionless and peering down with outstretched neck. In the Lotus-pond at the Pettah, Colombo, I have noticed it walking on the broad leaves with as much ease as the "Water-Pheasant;" and when flushed flying round the pond, finally alighting on the tall trees in the "Racket-court" enclosure. It has a curious guttural croak, which I have heard it utter when trying to drive it out of thick scrub. The food of this species consists of frogs, fish, water-insects, worms, &c.; but it also feeds on crabs and shrimps when frequenting salt-water localities. Its flight, though performed with a quick motion of its small wings, is laboured and slow.

Nidification.—It is probable that this little Bittern breeds about the same time in Ceylon that it does in India. There I find that Mr. Doig found its nests in Sindh in May and August, and Mr. Oates in Pegu in the same month. I am not aware that the nest has ever been found in Ceylon. It builds in the centre of a clump of bulrushes or reeds, or even in a tussock of grass, according to Mr. Doig. The eggs vary from three to five in number, and, according to the last-named gentleman, are "nearly spherical in shape," and when first blown of a delicate sea-green, fading after a time almost to white. They vary from 1·15 to 1·25 inch in length, and from 0·9 to 0·95 in breadth. Mr. Oates describes his eggs as without gloss and a pale green colour, four specimens varying in length from 1·26 to 1·31 inch, and in breadth from 0·93 to 0·97. Captain Butler describes two found at Milana as long and cylindrical, white, faintly tinted with skim-milk blue.

Subgenus ARDEIRALLA*.

As in *Ardetta*, but with the tibia not feathered to the knee.

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* As the very marked difference in the feathering of the tibia in the last and two following species precludes the possibility of my keeping all these in the same genus, I have retained *Ardetta* for the Eastern Little Bittern, as it is similar in all respects to *A. minuta*, the type of the genus *Ardetta*.

ARDEIRALLA FLAVICOLLIS.

(THE BLACK BITTERN.)

Ardea flavicollis, Lath. Ind. Orn. ii. p. 701 (1790); Jerd. Ill. Ind. Orn. pl. 16 (1847).

Ardetta flavicollis (Lath.), Blyth, Cat. B. Mus. A. S. B. p. 282 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 113; Jerdon, B. of Ind. iii. p. 753 (1864); Holdsw. P. Z. S. 1872, p. 478; Legge, Ibis, 1874, p. 30, et 1875, p. 404; David & Oust. Ois. de la Chine, p. 446 (1877); Hume, Str. Feath. 1878 (B. of Tenass.), p. 483, et 1879, p. 114 (List B. of Ind.); Doig, *t. c.* p. 376.

Ardeiralla flavicollis (Lath.), Salvadori, Ucc. di Born. p. 353 (1874).

Yellow-necked Bittern of some; *Blongios noir*, French. *Kala bagla*, Hind.; *Tototan*, Java (Horsf.). *Karu Nary*, Ceylonese Tamils.

Karawal koka, *Kalu koka*, Sinhalese.

Adult male and female (Ceylon). Length 23·5 to 25·75 inches; wing 7·8 to 8·0; tail 2·7; tarsus 2·6 to 2·8, middle toe and claw 2·6 to 2·8; bill to gape 3·7 to 4·1, at front 3·25; hind toe 1·23; claw finely pectinated.

Males (Tenasserim). Length 23·0 to 24·5 inches; wing 8·12 to 8·5, expanse 30·0 to 31·2; bill from gape 4·0 to 4·25: weight 8·0 to 9·0 oz. (*Davison*).—*Female* (Furreedpore). Wing 8·0 inches; bill from gape 3·8: weight 11·87 oz. (*Cripps*).

Iris in some golden, but in most examples I have seen red of various shades, with a fine inner brilliant golden ring, a dark brownish spot being sometimes present across the red portion; bill and orbital skin livid or red-brown, darkening into blackish towards the tip of the upper mandible, the base of the lower mandible paler (especially in the female) and the tip light horny; legs and feet dark livid brown, soles yellowish.

Iris—*Female* (Furreedpore) "light purplish brown" (*Cripps*); *male* (Tenasserim) "pale brown," *male and female* "crimson" (*Davison*). These data show the variation in the colour of the iris; the brown tint is probably indicative of immaturity.

Male (Ceylon). Top and sides of head, nape, hind neck, back, wings, and tail black, with an ashy tinge and a slightly greenish lustre on the scapulars and tertials; quills cinereous black; throat and a small spot on the face white: cheeks, ear-coverts, and a stripe down the chin and throat, spreading out over the fore neck, russet-brown, the terminal portion of the feathers black, and (on the fore neck) the outer half of one web white, imparting a striped appearance to the sides of the neck; from the white throat a broad golden-yellow stripe passes down each side, dividing the brown of the fore neck from the black of the hinder part, and becoming decomposed into stripes at the lower parts; lower neck-plumes cinereous blackish, margined with whitish and pale reddish brown; breast cinereous black, the terminal and outer parts of the lower breast- and abdominal feathers whitish; thighs concolorous with the flanks, edged with fulvous yellow; edge of carpal joint white; axillaries and under wing blackish slaty. In old birds the yellow stripe is very broad.

Female. Upper surface brown; the head and hind neck cinereous blackish; cheeks pale red-brown; the fore neck paler, the black terminal portions fading out on the lower part, which is broadly edged with white; there is more white about the throat, and the yellow stripes are broader than in the male; lower breast and abdomen whiter; thighs fulvescent whitish on the inner side.

Young. Birds of the year of both sexes have the upper parts tipped with fulvous, especially conspicuous on the back and wing-coverts, and scarcely perceptible on the crown—*males* being black, like adults, without the lustre; *females* chocolate-brown, like the adults, with the pale tippings browner; at the latter end of the first year the pale edges of the back-feathers have almost disappeared, from the result of abrasion. Birds in their first year are full-sized.

Obs. Chinese examples in the Swinhoe collection in Mr. Seebohm's possession correspond with Ceylonese. An adult

male measures—wing 8·2 inches, tail 3·2, tarsus 2·7, middle toe 2·2, bill to gape 3·9. A young bird identical in coloration with my skins measures—wing 7·9, bill to gape 3·5. Gould considers that Australian examples average smaller than Indian and Javan specimens.

Distribution.—So far as I have been able to ascertain, this species is a partial migrant to Ceylon, appearing on the west coast in November, between which month and March it may be always found in suitable localities near the sea. In the Galle district it is likewise only seen during the N.E. monsoon, and on the south-east coast I have met with it only at that period of the year. On the eastern side north of Kirinde I have never seen it; but it affects such close concealment that in wild and jungly country it is almost sure to be passed over. In July I met with it near Minery Lake, and it was no doubt breeding there; but it is apparently the exception to find it in Ceylon at that season, and unless, during the breeding-time, all the birds which are found in the Western Province effectually conceal themselves, they must, as a matter of course, leave the island. In the Colombo district it affects the secluded parts of the lake behind Colpetty, swamps near Borella, morasses and thickets bordering the Negombo canal, nooks in the Bolgodde and Panadure lakes, as well as rushy marshes and thickets near paddy-fields not far into the interior.

In India it appears to be a bird of most uncertain distribution. Mr. Fairbank records the finding of an example at Vilpati in the Palanis, and Jerdon met with it on the Malabar coast and near Madras; but elsewhere, in the south, I find no mention of its occurrence; it has not been very often met with in the Deccan, or in the tract of country between the Godaveri and the Ganges; at Calcutta it is occasionally seen in the market; but from Furreedpore it appears to be absent; while further north, in Tipperah, it has been procured. I find no record of its occurrence in the north-western part of the empire, except in Upper Sindh, and particularly on the Eastern Narra, a channel of the Indus, where Mr. Doig, C.E., found it breeding in large numbers in the month of May. Eastward of the Bay of Bengal this Bittern enjoys a wide range, extending from Burmah and Tenasserim to China, and thence southwards through the Malay archipelago to Australia. In Pegu it is found in the plains and in the nullahs of evergreen forests; but in Tenasserim it is very rare, only having been seen at Amherst, Bankasoon, and Attaran. In China it is common in summer in the central and southern portions of the country, inhabiting the mountains as well as the plains. It is found in Java, Sumatra, and Borneo, as also in Timor, Ceram, Batchian, the Aru, and other islands; it likewise occurs in the south of New Guinea, and in the northern parts of Australia round the Gulf of Carpentaria, while, on the east coast, Mr. Ramsay records it from Port Denison, Wide Bay, Richmond River, New South Wales, and Victoria. Elsewhere it is found in South Australia and on the west coast, so that it may be said to inhabit the vast length of the entire Australian sea-board. Gould first recorded it from New South Wales, Port Essington, and Swan River.

Habits.—This handsome Bittern partakes of the skulking nature peculiar to most of its relatives, and frequents, during the day, dense thickets, bushes, umbrageous creeper-covered trees, screw-pines, and such-like vegetation on the banks of water or in the middle of swamps; but more than all these does it haunt canals and dykes, which are lined with low bushy trees meeting one another and forming a dense overhanging canopy, beneath which, on moderately-sized limbs, the Black Bittern passes the day secure from scrutiny. It is also found in damp evergreen spots in timber-forests. In India it is said to affect rice-fields and reeds; but it is the exception to find it in such in Ceylon. It is not a particularly shy bird; and when it sallies out about 5 o'clock in the evening it may often be seen sitting upright, with its neck drawn in, on the top of a low bush, and on being approached will merely straighten its neck and place itself in an attitude of attention until the observer gets within easy gun-shot, when it will fly off with considerable speed, and often circle round the spot again and alight not far from its original position. It generally feeds near its roosting-place; but occasionally mounts in the air, and wends its way to distant fields, now and then uttering a loud hoarse croak. It climbs actively about the branches of trees, and always makes its way thus to the edge of the foliage before taking flight. Its food consists, to a great extent, of fish; but it likewise consumes frogs and lizards. Jerdon speaks of its low deep booming call, like the sound of a small drum; but this note I have never heard in Ceylon. During the day, when disturbed by the sound of a gun near their haunts, these birds leave their

roost, and, flying out, may sometimes be seen seated on the tops of bushes; but otherwise, after their return at daybreak from their night's work, they never stir till near sunset.

Nidification.—Mr. Doig has recently found the Black Bittern breeding on the Eastern Narra in Sindh. The nests were placed in thickets, generally "about 5 feet over the water, either in a dense tamarisk-bush or thick clump of reeds, and are about 9 inches in diameter and 3 inches in thickness, having a slight depression, in which the eggs, always four in number, are laid." These are described as being "broad ovals, sharp at both ends, and very nearly white in colour, but with faint suspicion of a delicate pale sea-green colour." They vary in length from 1·5 to 1·85 inch, and in breadth from 1·15 to 1·3.

ARDEIRALLA CINNAMOMEA.

(THE CHESTNUT BITTERN.)

Ardea cinnamomea, Gm. Syst. Nat. i. p. 643 (1788); Gray & Hardwicke, Ill. Ind. Zool. pl. 66. fig. 1 (1830–34); Hume, Nests and Eggs, iii. p. 622 (1875).

Ardetta cinnamomea (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 282 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 113; Jerdon, B. of Ind. iii. p. 755 (1864); Holdsw. P. Z. S. 1872, p. 478; Legge, Ibis, 1874, p. 30, et 1875, p. 404; Salvadori, Uccelli di Borneo, p. 354; Hume, Str. Feath. 1874, p. 311, et 1879, p. 114 (List B. of Ind.); David & Oustalet, Ois. de la Chine, p. 447.

Cinnamon Heron, Latham; *Le Blongios cannelle*, French. *Lal bagla*, Hind.; *Khyri bogla*, Bengal.; *Ayaman*, Java (Horsf.); *Burong kaladi*, Sumatra (Raffles). *Kuruttu Koku*, Ceylonese Tamils.

Metti korowaka, Sinhalese.

Adult male and female (Ceylon). Length 14·5 to 15·0 inches; wing 5·3 to 5·75; tail 1·6 to 1·8; tarsus 1·8 to 1·95; middle toe (without claw) 1·7 to 1·8, claw (straight) 0·38; bare tibia 0·5; bill to gape 2·45 to 2·6, at front 1·85. The tibia, in proportion to its length, is less feathered than in *A. flavicollis*; claws short, middle very finely pectinated.

Male (Furreedpore). Wing 5·75 to 6·08 inches; tarsus 2·08; bill to gape 2·8: weight 5·37 to 5·78 oz. (*Cripps*).—*Male* (Nicobars). Length 15·5 inches; wing 5·7; tarsus 1·7; bill at front 2·1 (*Hume*).—*Adult* (Formosa: coll. Swinhoe). Wing 5·7 to 6·0; tarsus 1·2 to 2·0; middle toe and claw 2·3; bill at front 1·9 to 2·1.

Iris pale golden yellow, in some with a few specks of brown; orbital skin greenish yellow; bill yellow, the culmen dark brown; legs and feet dusky greenish yellow, the tibia greener than the tarsus; soles, sides of toes, and posterior part of tarsus yellow; claws dark brown.

Head, hind neck, and all above chestnut, a tinge of ashy on the head and crest, and the wing-coverts paler than the rest; shafts of quills black; throat, fore neck, chest, and under surface yellowish rufescent, darkening to chestnut on the flanks, and with nearly always a brown stripe down the centre of the *lower* fore neck; a white stripe at each side of the gorge running backwards past the ear-coverts; pectoral plumes with yellowish-fulvous edgings. The "powder-down" tracts are well developed in this species.

Nestling, just fledged (Ceylon). Bill to gape 1·9 inch, tarsus 1·7. Forehead and crown olive-black; nape, hind neck, interscapulars, scapulars, lesser wing-coverts, and tertials rich dark brown, the feathers narrowly edged with rufous on the occiput, and elsewhere broadly margined with rufous buff, with a blackish inner edge; quills cinnamon-red, as in the adult; back and tail still in down (brownish, tipped with white); chin and throat whitish, with dark buff-edged centres, which widen on the chest and breast, the ground-colour there being rich buff instead of white; abdomen buffy white; thighs buff, the feathers centred with brown.

After this nestling-plumage is put off, and the dress of the first year assumed, considerable variation exists in the amount and lightness of the pale markings of the upper surface, and the dark coloration of the throat and under surface. The following is a description of a December example from the Colombo district:—

Iris yellow, with a dark spot across it; bill with the upper mandible and margin of the lower black, a dark stripe extending back to the eye; legs and feet green; toes dusky; soles yellow. Upper surface generally dark ferruginous brown, the basal portions of the feathers being reddish, while the marginal parts are brown, edged on the hind neck, back, and scapulars with buff-yellow, and deeply margined and indented on the wing-coverts with the same; quills, winglet, major coverts, rump, tail, and underlying tertials dull cinnamon, the winglet and coverts edged and indented with buff, and adjacently shaded with blackish; quill-shafts blackish and basal part of inner webs dark slate; forehead and crown ashy black; fore neck and under surface buff, boldly dashed, chiefly on one web, with rich dark sepia-brown, which down the central portion is edged with rufous, and runs up in a stripe to the chin; sides of abdomen, vent, and under tail-coverts buff, with narrow dark mesial lines; under wing-coverts fulvous yellow, with slaty centres.

In this very handsome stage the ground-colour of the upper surface is likewise subject to variation, some examples being more cinnamon-coloured than others.

At the next moult the upper surface becomes more uniform, the edgings disappear, and also the stripes on the neck and under surface, leaving in the nearly adult bird a brownish line down the centre of the fore neck, which seems in but few cases to disappear altogether.

Obs. In a series of adults from China and Formosa most examples have traces of the dark stripe down the fore neck; the hue of the back and wings is the same as in Ceylonese birds. An Amoy specimen is a good deal tinged with ashy on the head and back; but this is a point in which Ceylon birds vary. Immature birds in first plumage exhibit variations as above noticed.

Distribution.—This remarkably-plumaged Bittern is very abundant in Ceylon, being spread over all low-country marshes, paddy-fields, and swamps, and ranges into the hills to an altitude of more than 4000 feet, at which it has been procured near Banderawella by Mr. S. Bligh. Although widely distributed, it is more abundant in the west and in the damp parts of the south of the island than in the north. It is essentially a grass-frequenting bird in Ceylon, and is consequently for the most part restricted to the districts under rice-cultivation, and to moist places and swamps which afford it cover. In the north it is found mostly about rushy tanks. It is the commonest of its group about Colombo, frequenting the "water-grass" fields and swampy fern-brakes in the cinnamon-gardens. In the Kurunegala district and in the Seven Korales, as also about tanks in the Anaradhapura district, it is common.

The Chestnut Bittern appears to be distributed sparingly throughout the south of India. As regards the north-west of the empire, it has only been found in Ajmere by Major St. John and in Sindh by Messrs. Butler and Doig. Mr. Hume writes that it occurs sparingly in the Punjab, Cis-Sutledge, and in the upper portions of the North-west Provinces west of the Ganges, but only as a visitor during the wet season; he also obtained it in the Delhi, Meerut, Alleghur, Mynpooree, and Etawah districts, but has never seen it from the Central Provinces, the Punjab, Rajpootana, Guzerat, Kutch, or Kattiawar. In the district between the Ganges and the Godaveri Mr. Ball met with it but once in the State of Udipur; but about Calcutta it breeds freely, writes Mr. Hume; in Furreedpore it is common, and to Cachar it is a visitant in June. In Upper Pegu it has not been noticed, but it inhabits the lower part of the province and breeds there; and in Tenasserim it was obtained by Captain Wardlaw Ramsay on the west of the Sittang, and is common in the southern districts. Further south it has been met with at Malacca. Mr. Hume obtained it at Tellangchong, in the Nicobars, and in the island of Preparis. It extends westward to China, where it was first discovered, visiting that empire in summer, and ranging northwards to Mantchuria and Amoor Land, where Schrenck found it breeding near the village of Dawunda, on the left bank of the Amoor. It has also been found in Japan, although it is not recorded by Messrs. Blakiston and Pryer. Turning southwards we find it occurring in Formosa in summer, and recorded from the Philippines by Schlegel and Von Martens; and Mr. Everett has lately procured it in Luzon in February. In the Malay archipelago it has been met with in Sumatra, Java, and Borneo, in the latter island in the Banjermassing district. Governor Ussher records it from Labuan.

Habits.—The Chestnut Bittern prefers long grass, standing paddy, or rushes near water to swampy brushwood or even tall reeds. It is consequently invariably found in the paddy-fields in Ceylon as soon as the grain is a good height; to the fields of water-grass, cultivated near towns in the Western Province for horse-fodder, it is also very partial. It is not a shy bird, generally getting up from its retreat when you are within a few paces of it; it then flies off with a guttural but not loud *croak*, sometimes rising pretty high in the air and making the circuit of the field before alighting, at other times flying a few yards just above the grass and realighting. It drops the legs and erects the head slightly to check its progress on alighting. It feeds in the afternoon after three o'clock, for it may be seen flying about of its own accord long before evening sets in. I have rarely seen it at the edge of streams; but in India it is said to affect reed-beds and brushwood on rivers, coming out to feed in the morning and evening, and keeping quiet during the day; and, according to Mr. Davison, whose remarks I here quote, it is very shy, betaking itself on the least alarm to dense cover, from which it is very difficult to dislodge it. When wounded it fights vigorously, darting out its open bill

with great force, and making a harsh craking noise. The food of this species consists of worms, aquatic insects, frogs, and fish.

Nidification.—This Bittern breeds in the Western Province in June and July, building a nest of grass and rushes in a clump of grass in the middle of a field, or in a bush growing by the side of a drain, sometimes a few feet above the ground. A nest I found in a bush in a water-grass field near Colombo was made of dry grass, neatly hollowed out in the interior, and lined with finer grass laid crosswise in different directions, the cavity measuring about 8 inches across. Another, found by the taxidermist of the Colombo Museum at Kæsbawa, was built in the middle of a clump of water-grass, with some of the standing stalks bent down to form a bottom for the nest. This contained three fresh eggs, pure white, very oval in shape, and measuring 1·27 by 1·0 inch, 1·26 by 1·05, and 1·31 by 1·02. In India the nest has been found supported on reeds bent down for the purpose on the ground against the roots of water-plants, propped up with roots of rushes, and in all cases composed of rush, grass, reed-leaves, and stalks. Six appears to be the maximum number of the clutch, the eggs having sometimes a bluish-grey tinge, according to Mr. Hume. They vary in length from 1·2 to 1·4 inch and from 1·0 to 1·1 in breadth.

Genus NYCTICORAX.

Bill stout, high at the base; culmen curved near the tip; gonys straight, naral groove almost joining the commissure near the tip; sides of both mandibles inflated near the base. Wings rounded; 2nd and 3rd quills the longest. Tail short and rounded. Legs moderately short; tibia less feathered than in *Ardetta*. Tarsus reticulate on the inside; claws attenuated.

Head with a long crest of two or three attenuated feathers; neck short and thick.

Of nocturnal habit.

NYCTICORAX GRISEUS.

(THE COMMON NIGHT-HERON.)

Ardea nycticorax, Linn. Syst. Nat. i. p. 235 (1766, ex Briss.); Von Heuglin, Orn. N.Ost-Afr. ii. p. 1086 (1873).

Ardea grisea, Linn. Syst. Nat. i. p. 239 (1766, ex Brisson).

Nycticorax europæus (Steph.), Shaw, Gen. Zool. xi. p. 609 (1819).

Nycticorax griseus (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 281 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 114; Jerdon, B. of Ind. iii. p. 758 (1864); Holdsw. P. Z. S. 1872, p. 478; Legge, Ibis, 1874, p. 27, et 1875, p. 403; Salvadori, Uccelli di Born. p. 356 (1874); Hume, Str. Feath. 1879, p. 114 (List B. of Ind.); Dresser, B. of Eur. pts. 75, 76 (1879).

Nyctiardea nycticorax (Linn.), *apud* David & Oust. Ois. de la Chine, p. 444 (1877); Hume, Nests and Eggs, iii. p. 624 (1875).

Le Bihoreau, Buff. Pl. Enl. 758. *Wak*, Hind.; *Koma dauk*, *Oyah*, Beng.; *El Waq*, Arabic; *Kwak*, Dutch; *Gadri*, Sindh; *Guwo*, Java; *Sannary*, Ceylonese Tamils.

Rœ kana koka, Sinhalese.

Adult male and female (Ceylon). Length 21·5 to 23·5 inches; wing 11·5 to 11·7; tail 4·0 to 4·4; tarsus 3·1 to 3·3; middle toe 2·5 to 2·6, its claw 0·6; hind toe 1·1; bill to gape 3·5 to 3·7, at front 2·6 to 2·9.

Adults (Nepal). Length 20·0 to 24·0 inches; wing 10·8 to 11·5; tail 4·1 to 4·5; tarsus 2·7 to 2·9; bare tibia 0·6 to 1·03; bill to gape 3·6 to 3·9, at front 2·8 to 3·0 (*Scully*).—*Female* (Furreedpore). Wing 11·0; tarsus 2·75; bill to gape 3·82 (*Cripps*).—*Adults* (China, Formosa, ♂). Wing 11·3; tarsus 3·0; bill to gape 3·6 to 3·7.—*Adult* (Egypt). Length 21·0; wing 12·0; bill at front 2·8; tarsus 3·0 (*Shelley*).—*Male*. (Malta) Length 21·0; wing 11·7; tarsus 3·05; bill to gape 3·7. (New Brunswick) Wing 12·5; tail 4·7; tarsus 3·25; bill from gape 4·05 (*Dresser*).

Iris variable, deep red, crimson, scarlet; bill—upper mandible black, loral skin and gape bluish green, base of under mandible greenish yellow, tip black; legs and feet pale orange-yellow, in some yellow.

Head, nape (on which the feathers are much elongated), upper back, and all but the lower or underlying scapulars metallic black-green, pervaded with ashy in some lights; forehead round the eye, chin, cheeks, throat, and all beneath white, washed with buff on the underparts, most conspicuously on the lower neck-plumes, and darkening on the sides and back of neck into delicate ashy greyish; wings, lower back, and tail sombre bluish grey, darkest on the tertials and centre tail-feathers; edge of wing, margin of first primary, and a long crest of two or three narrow feathers, closely overlying each other, white; the crest-feathers 6 to 7½ inches in length. The underlying or broad scapular feathers in some are partly coloured as the uppermost, and in others wholly grey. The back of the neck is almost white in some, and the under surface likewise lacks the buff tint.

Young. The nestling has the eye pale sea-green; lores and bill tinged with yellowish green; legs bluish sea-green above, sienna-yellow beneath; colour of the down light purplish grey, tipped with white on the crown, and giving place to white on the flanks and belly; bare skin of the belly and also of the back sea-green. (*Swinhoe*.)

In the *first plumage* the iris is orange, orbital and loral region greenish, the tips of both mandibles yellowish horny; legs and feet bright pea-green, soles yellow: wing 10·3 to 10·5.

Upper surface light cinereous brown, darkening to glossy blackish brown on the head, and to a slightly less intense hue on the interscapular region, while the wings are brownish slaty; feathers of the head and upper back with whitish narrow mesial lines, the hind neck edged buff, and with fulvous white mesial centres; the scapulars and median wing-coverts with broad angular white terminal spots, and narrow mesial lines on the latter, the greater wing-coverts, winglet, and secondaries with deep white tips, and the primaries with whitish-grey tips; the least coverts are narrowly edged with buff; the face and cheeks are striated with dark brown on a white ground; chin and throat, centre of fore neck, breast, and lower parts buff-white, the feathers on the middle of the fore neck

with dark brown dashes, those on the breast with cinereous edges, and the rest unmarked; thighs light slaty, edged fulvous; the inner sides whitish.

At the next stage, which is probably at the commencement of the second year, the legs are greyish yellow. Upper surface of a much darker cinereous brown, the head and upper back washed with blackish green, the head and hind neck with fulvous mesial stripes; the edges of the wing-coverts are fulvous and indistinct, as also the angular tips of these feathers; tips of the winglet and secondaries with one or two of the outer primaries white; face and sides of neck darker, with buff stripes; the fore neck and breast buff-white, shading into slaty grey at the exterior of the feathers; the thighs whitish.

The crest is not assumed until the uniform plumage of the adult is acquired, which is probably not until the third year. It usually consists of two or three feathers; but occasionally specimens have five or six; and Mr. Dresser instances one with *ten*.

Obs. Chinese specimens are identical with Ceylonese; the tints vary in the same manner, some are more buff beneath than others; and this is probably a result of age. As will be observed from Mr. Dresser's measurements, American specimens are the largest. Layard's dimensions for South-African examples are likewise large, if correct—wing 13·0.

N. caledonicus, Lath., is the Malayo-Australian representative of this species, and differs in having the mantle, scapulars, wings, and tail fine cinnamon-colour; the crest-feathers are similar and the legs longer: wing 9·5 to 10·5 inches. It is beautifully figured in Mr. Gould's 'Birds of Australia.'

N. manillensis, Vigors, which inhabits the Philippines, is larger than the last-named, and with the red of the upper surface deeper: wing 11·0 to 11·5 inches.

Distribution.—The Night-Heron is found in most low-country districts of the island; but it confines itself to particular localities, and is easily passed over if the secluded spots in which it takes up its quarters do not happen to be visited. It is now and then seen on the Colombo lake, but only as a straggler. At the head of the Bolgodde lake, in a small arm overgrown with immense reeds, and lined with thickly-foliaged trees, I found a very large colony. On the Amblangoda lake there is another. About Matara it is not uncommon, and near Tangalla Layard discovered it on a lake there. Numbers were found by me at the tank before mentioned, near Tissa Maha Rama. It occurs near large tanks in the Eastern Province, and in the Trincomalie district I have discovered small colonies. At the head of the Pootoor lagoon, in the Jaffna peninsula, it also occurs; and Mr. Parker informs me that it is not uncommon in suitable localities throughout the North-western Province.

In India it is very common in many parts, but, as in Ceylon, it is local in its distribution. It is moderately common in the Deccan, and likewise near Ahmednagar; also in Chota Nagpur, where Mr. Ball records it from the Rajmehal hills, Manbhum, Lohardugga, Singhbhum, Sambalpur, Orissa, Nowagarh, and Karial; and Mr. Hume notes it from Raipur. It occurs about Calcutta, and in Furreedpore is abundant. It is not recorded from Cachar. In Upper Pegu it is abundant in the great Engmah swamps, and breeds in great numbers near Myitko, on the Sittang. Dr. Armstrong found it rare in the delta of the Irrawaddy; but in Tenasserim it is generally distributed. Mr. Davison noticed it in the Nicobars; but I do not find it recorded from the Andamans. Returning to the mainland, it is common in the North-west Provinces, and is found further north in the Punjab and Cashmere, extending into the Himalayas up to an altitude of 6000 or 7000 feet. It is distributed throughout Sindh, Kutch, Kattiawar, and Jodhpoor; but is not recorded from the vicinity of the Sambhur lake by Mr. Adam. It has been met with in Persia at Isfahan and in the Shiraz district, and inhabits the western portions of Turkestan, breeding up to an altitude of 4000 feet. Dr. Scully did not observe it in Kashgharia, nor did Prjevalsky encounter it anywhere in Mongolia, although it is very common in China, particularly about Pekin. It is generally distributed in South Japan. Southward it is resident in Formosa as well as in China, and likewise inhabits the Philippines. It is recorded from Celebes, Ceram, Borneo (Banjermassing), Banka, and Java; but further south is replaced by *N. caledonicus*, which is also found in Celebes.

Returning now to the continent of Asia, it does not appear to range further north than Turkestan. Canon Tristram met with it in Palestine, and it also occurs in Asia Minor. In Europe it is chiefly a summer visitant, inhabiting as such the southern countries and the Mediterranean islands, and passing into Northern Germany, Poland, and Holland, where it used to be commoner than it is now. It, however, breeds in the

south of France, though it occurs only on passage in the north. To the British Islands it is a rare straggler, having occurred chiefly in the southern and eastern counties as far north as Northumberland and Durham, while in Scotland it has been met with as far north as Aberdeen. It has been shot in Anglesea and Flintshire, and has been met with occasionally in Ireland, once in the county of Donegal. It has also occurred in the Faroes and in Sweden, but not in Norway; in Denmark it is very rare. In Central Russia it is also scarce, but common in the south and even on the Lower Volga. Turning now towards Spain and thence to Africa, we find it common in the southern portion of the first-named, breeding in the marshes of the Cotos, and passing north through Andalucia in April. It appears to pass by Portugal in its migration, as it is not common in that country. In Morocco it is chiefly seen on passage, being common there near Tangier. Canon Tristram met with it in Algeria and Tunis, and in Egypt it is abundant. In January, February, and March, Von Heuglin met with it on the Blue and White Nile, and at the Tana Lake in Abyssinia, where he also saw it on the river Reb in May. It extends to South Africa, having been obtained in the Zambesi country, in the Transvaal, and in Natal, and is generally found throughout Cape Colony. In Damara Land it is rare, according to Mr. Andersson; but in the lake-country it is pretty common, occurring in Ondonga in the wet season, and also on the Orange river. Further north it has been obtained in Benguela and Gaboon, on the Gold Coast, in Fantee, Senegambia, and Bissao. Vernon Harcourt records it from Madeira; but it does not appear to have been met with there of late years.

On the continent of America it has a wide easterly range, extending from New Brunswick through the States to Texas and Central America, in the former of which Mr. Dresser found it common. In South America it ranges, according to Von Frantzius, from Guiana to the Argentine Provinces, being rare in Costa Rica. It is likewise found in some of the islands in the West Indies, being resident in Cuba.

Habits.—This curious bird is almost entirely nocturnal in its habits; but I believe it feeds chiefly at dusk and in the early morning. It is seldom seen about in the daytime; but occasionally it happens, for some reason or other, that it makes diurnal excursions. Mr. Ball writes, "On a very hot day in April, when in the district of Singbhum, I saw a large number of them in the bed of a river standing by the water's edge, and perched about on neighbouring bushes." My own experience in Ceylon is that when aroused by the report of a gun, a whole flock will dash out of the umbrageous trees in which they have been hiding, and circle round and round in the air, some turning right away and taking a long flight across country. It frequents secluded portions of lakes and tanks, where there are reed-beds surrounded by bushy trees, in which it roosts by day, as many as thirty or forty sometimes occupying the same tree. In the forest-districts it resorts to village tanks surrounded by thick jungle growing close to the water's edge; and when a colony has taken up its abode in any place, its members dwell permanently there, breeding close at hand, or perhaps on the very spot. At sunset they sally out, flying with slow noiseless owl-like flaps, and frequently uttering their quick hoarse *quāk* at intervals of some little duration; and this call is often heard as night closes in, when the bird cannot be seen. When perched, the Night-Heron draws the neck in, the bill projecting from close to the shoulders, and the body upright, imparting an ungainly appearance to the bird; if disturbed, it makes its way quickly through the tree, adroitly climbing from branch to branch, and flying off quietly on the other side. Mr. Dresser has noticed it climbing about reeds and rush-beds in Texas, "grasping the stems of the water-plants with its long claws." It has the power of balancing itself in a wonderful manner when walking along a small branch; and Mr. Gurney speaks (Ibis, 1868, p. 257) of one, which was confined in the Zoological Gardens, "walking leisurely along the slender upper bar of an iron railing, some three yards in length, preserving his balance most perfectly, keeping his body nearly parallel to the horizontal iron bar, and not in any way resorting to the aid of his wings." A fine living example was brought to me at Galle in 1873, and I placed it in a large bamboo aviary, in which were confined a Crested Eagle and a Wood-Owl, both referred to in the early part of this work. On being first placed in the aviary, it slunk into the corner, and did not become aware of the presence of the Raptorial birds; about an hour afterwards it discovered them, and displayed the most curious movements of surprise and curiosity. Its head moved at slight intervals from side to side, but with an instantaneous jerk, and shot out every now and then with the same movement, the feathers of the back, neck, and occiput being at the same time erected and the eyes fixed on the two birds, one of which (the Owl) manifested the most intense surprise at the extraordinary creature beneath him, while the Eagle stood on one leg, with

the other composedly drawn up, and twisted his head upside down, to get a better view of the stranger! It was, on the whole, one of the most comical bird-sights I ever beheld. Subsequently, when either of the birds approached it, it shot out its head in like manner, erected its feathers like a porcupine, and gave vent to a loud Heron-like crake, quite different to its usual hoarse croak. It eat nothing for weeks, although I tried it with worms, frogs, &c.; and as it appeared to be thriving, I was under the impression that it captured worms at night from the floor of the aviary. One morning, however, I found it dead; and on skinning it, it was almost a skeleton, proving that it had eaten almost nothing for seven weeks! Its legs had changed from orange to pale yellow.

The food of this Heron consists of fish, worms, frogs, and large aquatic insects. In India it nearly always roosts on tamarind-trees.

Nidification.—The Night-Heron breeds in the early part of the year in Ceylon. In March 1872 a colony were nesting at Uduwila tank, near Tissa Maha Rama; they chose the thickly-foliaged trees, apart from those on which the Herons, Ibises, Cormorants, and Pelicans were nesting; and the nests, made of small twigs and sticks, were concealed among the branches. There appear, however, to have been other birds (*Herodias garzetta*) nesting in the same tree, as some eggs I took, and sent to Mr. Hume, turned out to be too small for the Night-Heron. In India, where it breeds often in its favourite tamarind-tree, but also occasionally in rushes and reeds, the breeding-time is in July and August, and in Cashmere in April and May. The eggs are short ovals, and delicate pale sea-green in colour, ranging in length from 1·68 to 2·06, and in breadth from 1·3 to 1·45 inch (*Hume*).

In China, where it is held sacred in some parts, it nests in public places. Mr. Swinhoe gives an account of a colony at the great Honan Temple, where the nests are placed in banyan-trees within a foot of each other. The parents supplied their young with food throughout the day; but at night they all became more active, flying off their nests, and settling first on the bare arms of the cotton-trees (*Bombax malabaricum*), like gaunt spectres, after which they flew away one after the other, "seldom more than two in the same direction." As darkness set in, he writes, "many returned, and the noise and hubbub from the trees rose to a fearful pitch."

Genus GORSACHIUS.

Bill short, stout, curved; the gonys short and slightly ascending; naral groove deep. Nostrils wide; under mandible laterally compressed at the base. Wings pointed, the 3rd quill the longest; tertials lengthened, exceeding the closed primaries. Tail short. Legs and toes short; tarsus reticulate. Toes bordered by a narrow membrane; hind toe proportionately long; claws short.

Neck short and densely feathered; head crested; plumage soft.

Of nocturnal habit.

GORSACHIUS MELANOLOPHUS.

(THE MALAY BITTERN.)

Ardea melanolopha, Raffles, Tr. Linn. Soc. xiii. p. 326 (1821, Sumatra).

Tigrisoma melanolopha (Raffl.), Blyth, Cat. B. Mus. A. S. B. p. 281 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 114.

Ardea goisagi, Temm. et Schl. Faun. Japon. *Aves*, p. 116, pl. 70 (1850), ex Temm. Pl. Col. 582.

Gorsachius melanolophus (Raffl.), Holdsw. P. Z. S. 1872, p. 478; Salvadori, Uccelli di Born. p. 355 (1874); Walden, Tr. Zool. Soc. 1875, ix. p. 238; David & Oustalet, Ois. de la Chine, p. 444 (1877).

Goisakius melanolophus (Raffl.), Hume, Str. Feath. 1874, p. 312, et 1879, p. 71 et p. 114 (List B. of Ind.); Bourdillon, ibid. 1875, p. 524.

The Malay Tiger-Bittern of some.

Rœ koka, Sinhalese.

Adult male (Ceylon). Length 19·5 to 19·7 inches; wing 10·5 to 10·7; tail 3·75 to 4·0; tarsus 2·6 to 2·8; bare tibia 0·75; middle toe 2·0, claw (straight) 0·3; bill to gape 2·5 to 2·7, at front 1·8; pectination of middle claw even, expanding and reaching to the tip of the claw.—*Male* (Travancore). Length 19·62; wing 10·37; tail 3·62; tarsus 2·69; middle toe (with claw) 2·0; hind toe 1·06 (*Bourdillon*).—*Female* (Nicobars). Length 17·0; wing 9·12; tail 3·0; tarsus 2·3; bill from gape 2·4; weight 0·75 lb. (? 1·75) (*Hume*).

Iris golden yellow, "frosted" or stippled with olive at the exterior; gape, orbital and loral skin greenish and slaty; culmen black; sides of upper mandible and the lower fleshy; legs and feet greenish, washed with brown on the front of the tarsus and toes.

Top of head, nape, and long occipital crest blackish slate, pervaded with an ashy hue; face, over the eye, hind neck and its sides cinnamon-rufous, pervaded near the edges with ashy, and more particularly on the cheeks; interscapular region, scapulars, wing-coverts, and tertials duller rufous than the hind neck; the feathers mottled with obscure slaty, this being almost absent on the interscapulary part, which is pervaded with bluish ashy; lower back and tail ashy brown; primaries, winglet, and secondaries blackish slate; terminal portion of primaries and secondaries dull rufous; primary-coverts brighter rufous, tips of three first primaries and two outer winglet-feathers white; chin and gorge white, blending into the ashy fulvous of the fore neck; the plumes of the throat and middle of the lower neck for the most part white on one web and more or less black on the other, marked with rufous and buff, on the first-named part these are mostly concealed; feathers of the chest mostly white down the centre, surrounded by rufous or fulvous which is clouded with black; on the breast the white spreads over one web, leaving the other rufous, crossed and marked with white; towards the abdomen the white predominates, the rufous gradually disappearing, the edges paling to buff and marked with blackish brown; flanks crossed with black and white dashes, the edges of the feathers being fulvous, mottled with black; major, secondary, and tertial under wing-coverts handsomely crossed black and white, and washed on one web with rufous; lesser coverts blackish brown, barred and spotted with white, those beneath the ulna and the metacarpus being washed with rufescent. The "powder-down tracts" are small and grey in this bird.

Female (Nicobars). "Iris greenish yellow; upper mandible horny brown, edged with dull green; lower mandible greenish horny; legs and feet dull green, claws horny. Differs from the male in having no line of dark spots down the centre of the chin and throat, in having no feathers of the crest as dark as in the male, and in having several of them, and amongst others the longest, a sort of purplish red instead of black; the whole mantle is somewhat paler, and the quills are markedly slaty; the barrings of the wing-lining, sides, &c. are much less conspicuous and less tinged with ferruginous; the ground-colour of the breast is more of a fawn-colour tinged with ferruginous, and there is much more white about the abdomen, and this is less rufescent than in the male." (*Hume*, comparison of Nicobar female with a male.)

Concerning a specimen in the Colombo Museum, I find I have noted that the chin and throat are pure white, con-

trasting with the blackish-brown sides of the fore neck, which are barred with fulvous, but no mention is made of the different colour of the crest. It is important to note that in Mr. Hume's specimen some of the feathers are ferruginous, as this is the main point in which most of the Japanese examples have differed from Indian; and it may be that the rufous colour is a sexual peculiarity; but it is more likely an individual one, as will be seen presently.

Young nestling (Takow: Mus. Seebohm). Primaries half-grown; wing 7·0 inches, tarsus 2·7.

Head and occipital feathers black; the coronal feathers with pure white mesial lines, and the occipital feathers with oval central spots, two on some feathers and one on others; hind-neck feathers brown, with transverse spots of white; back and scapulars brown, with narrow wavy cross bars of buff, almost obsolete on the back, taking the form of wavy pencillings on the wing-coverts, and there overcoming the dark markings; the winglet, primary-coverts, and quills nearly as in the adult, but the latter wanting the rufous near the tips; tail brown; chin and throat whitish; fore neck dusky buff, barred with blackish; on the sides of the neck the barring is narrow; breast buff, barred and irregularly marked with slaty blackish; lesser under wing-coverts the same, the greater series white with dark bases.

A second nestling of same date (June 1865), and probably a fellow bird, is marked on the head in the same manner, but the back is altogether different, the major portion of the feathers being black with a large buff central spot and indistinct tippings of rufescent; the ground-colour of the wing-coverts is more rufous; surmounting the white tips of the primaries there is a small amount of rufous.

Immature birds almost, if not quite, equal adults in size. An example in the Colombo Museum measures—wing 10·1 inches; tail 3·75; tarsus 2·5; bill at front 1·2. During adolescence the plumage is somewhat similar to that of the nestling's above described, being characterized by the white tips and bars on the crest-feathers and the conspicuously marked upper surface.

An *immature* example shot near Colombo has the forehead, crown, and long crest-feathers black, with buff tips on the head, and white central spots and tips on the crest-feathers; back and sides of neck and whole upper surface dark bluish brown, with irregular wavy bars and edgings of buff and light ferruginous; upper tail-coverts and rump blackish brown, with a white spot near the tip of most of the feathers; quills and tail much as in the adult, but with more of the tips white and less chestnut adjacent to them; tertials conspicuously mottled like the scapulars; primary wing-coverts chestnut with white tips, edged above with dark pencillings; chin and throat white, the centre of the fore neck conspicuously marked with brown, white, and ferruginous; the lower neck-feathers mottled with ferruginous on the inner webs, and with a longitudinal black border down the shaft, and the outer webs white, with yellow edgings; under surface as above described in the adult.

Obs. A male from Formosa has the head rufous like the hind neck, just tinged with ashy, the crest rufous and not so long as in other specimens; the interscapular region and back are uniform dark rusty brown; the ground-colour of the wing-coverts is rufous; there is a stripe down the throat, and the dark markings of the breast and flanks are very bold. Dimensions—wing 10·2 inches, tarsus 3·05. This specimen has some resemblance to a figure of a "young female" in the 'Fauna Japonica,' pl. 20. Two other examples in the "Swinhoe collection," from Formosa (not sexed), have the head equally dark; but one is more rufous throughout than the other. The ground-colour of the wings of the paler bird is rufescent buff; the underparts are in a corresponding degree white, lacking the rufous edgings on the abdominal feathers. It corresponds with the description above given of the Nicobar female, but it has a stripe down the chin. Dimensions of these two birds—wings 10·3 to 10·5 inches; tarsus 2·6; bill to gape 2·4 to 2·7. On the evidence afforded by the first of these three specimens, procured in March, Swinhoe affirms that the dark crest in the Eastern form is dropped in winter and red feathers worn instead. I think, however, that this solitary evidence is insufficient, particularly as we have a Nicobar female in much the same plumage. It would appear rather to be an individual peculiarity; and I see no reason to consider the Japanese and Formosan bird distinct from the Malaccan. Lord Tweeddale, however, affirms that the bill, in all Malaccan examples he has examined, is longer and straighter than in a Nagasaki specimen.

Distribution.—This handsome Bittern, which is a north-east monsoon migrant from Malacca to India and Ceylon, was discovered in the latter many years before it was noticed on the mainland. Layard procured three specimens about Colombo in November 1852, and added the species to the avifauna of Ceylon in his "Notes." Many years after, in the same month in 1860, Mr. Holdsworth captured a specimen at Aripu; and again, in November 1876, a fine example, now in the Colombo Museum, was shot near Colombo. Another specimen was caught on the Colombo lake in November 1875; and in October of the following year a male

(above described) was captured at Mutwal and brought to me, whilst a female at the same time was procured in the vicinity of Colombo and taken to the Colombo Museum. A few months afterwards, in March 1877, an example was killed in jungle in Maskeliya at an elevation of 6000 feet. It will be evident to my readers, from the above data, that it arrives on the west coast of Ceylon in October and November, and is then captured in populous districts like Colombo before it makes its way inland. It is worthy of note that it has not been met with on the east coast, notwithstanding that it migrates from the east to Ceylon. It may have a tendency to move westward as far as possible, and may, consequently, cross the north of Ceylon and follow the west coast down, or it may first arrive in the south of India and wander south with the long-shore wind.

It was first procured in South India in January 1878, when a specimen was captured in the hills of Southern Travancore at about 2500 feet above the sea-level, and passed into the hands of Mr. Bourdillon; and about eighteen months previous to that time Mr. Hume writes that Mr. Inglis procured an example at Dilkoosha, North-eastern Cachar. It was met with in the Nicobars by Mr. Davison at Camorta, where two birds were captured at False harbour; and at Tellanchong Mr. Hume procured a third; while he subsequently writes that other specimens have been obtained in these islands. It has been seen in Tenasserim in the mountains north of Malewoon. In the peninsula of Malacca it is supposed to be resident, and is probably so in Sumatra, whence it was first described by Raffles. It has recently been obtained at Brunei and on the Lawas river in Borneo by Mr. Treacher. Northward in the Philippines it has been also procured, as there is a specimen in the British Museum from that locality. It is resident in the island of Formosa, in which Swinhoe procured five specimens—one, a male, in March, two young in July, and two adults in May; the young birds were captured at the foot of the mountains; Swinhoe remarking that the species is chiefly confined to the jungly interior, rarely occurring on the plains. Père David notes it from Cochin China. From Japan Temminck first recorded it, and subsequently specimens have been obtained at various localities, one of which is noted by Mr. Blakiston from Yokoska, Tokio Bay.

Habits.—From observations made in the Nicobars and Formosa, as also on one occasion in South India and in Ceylon, it is pretty certain that this Bittern is chiefly an inhabitant of jungle, frequenting the borders of streams lined with rushes, small swamps, and scrubby morasses in forest. In Ceylon it has been for the most part captured in comparatively open situations; but this has been owing to its having been met with directly after its arrival, on the shores, and before making its way into the interior. Mr. Holdsworth obtained his example in some bushes close to his house by the seashore. Most of the specimens procured near Colombo came from the Slave-Island Lake; and the bird brought to me was captured in the top of a cocoanut-tree from which "toddy" was being drawn, and having endeavoured to allay its thirst in the toddy-chatty, had become stupid and was easily captured! Such was the account, at least, given by the native; and certainly the bird presented all appearance of being in a state of intoxication. It stood with closed eyes, allowing its head to droop forward every now and then until its bill touched the ground, and when pushed would wake up with a start and a flap of its wings. In this state it remained for about two hours after it was brought to me, and then recovered itself. It was placed in an aviary in company with a Wood-Owl (before mentioned) and a Skua (*Stercorarius antarcticus*), and when accustomed to its new abode passed much of its time perched on a low stake, its usual attitude being with the neck drawn in, the head kept forward, and the bill pointed upward, its eyes all the time possessing a vacant stare. It would patrol round and round the aviary with slow and stealthy steps, and always snapped up whatever fell from the Owl's perch. Large pieces of meat were swallowed greedily, and insects picked up from the ground. When inclined to be pugnacious, he would elevate his crest and puff out the feathers of his face and throat, spasmodically opening and shutting his bill at the same time. After a while the Skua tormented him sadly, seizing him always by the wing and dragging him about the aviary; he seemed to be much afraid of this bird, not offering to defend himself, although he always remained hostile to the Owl. Mr. Davison was informed by natives in Camorta that the note of this Bittern was loud and like a bark, and they asserted that it remained throughout the day seated on a branch or concealed among *Pandanus*-thickets.

Nothing is known of the *nidification* of this species.

Order STEGANOPODES.

Bill varied, straight and pointed in some, hooked in others, furnished with a pouch beneath, more or less developed. Wings pointed, mostly long. Tail very varied. Legs and feet short. Toes fully webbed, the hind toe directed inwards, except in one family; the outer toe longer than the middle.

Of oceanic habit, taking their prey either by pouncing or swimming. Young born blind and helpless. Sternum wide; the keel not produced much beyond the middle, its upper edge in the prolongation of the posterior part of the sternum; the furcula united to the keel by a close joint, in some completely joined to it.

Fam. PHAETHONTIDÆ.

Bill stout, not hooked at the tip, the margins serrated. Tail with the centre feathers long and much attenuated. Legs short. Feet large; the toes webbed, the hind toe directed inwards and webbed.

Of comparatively small size. Plumage satiny and white.

Genus PHAETHON.

Bill stout, acute at the tip as in *Sterna*, but curved throughout, with the gape wider and angulated or lobed; the margins serrated. Nostrils basal, linear, placed in a membrane near the culmen. Wings moderate, pointed, the 2nd quill the longest, 1st exceeding the 3rd. Tail short, pointed, the central pair of feathers enormously elongated and attenuated. Legs short, tarsus reticulate. Feet finely webbed; hind toe short, directed to the front and webbed.

PHAETHON FLAVIROSTRIS.

(THE YELLOW-BILLED TROPIC-BIRD.)

Phaëton flavirostris, Brandt, Bull. Acad. Sc. St. Petersburg, ii. p. 349 (1837); Holdsw. P. Z. S. 1872, p. 482; Hume, Str. Feath. 1874, p. 323, et 1879, p. 116 (List B. of Ind.); Penrose, Ibis, 1879, p. 277.

Phaëton candidus (Briss.), Jerdon, B. of Ind. iii. p. 850.

Phaëthon flavirostris, Brandt, Sclater & Salvin, P. Z. S. 1878, p. 651.

Boatswain-bird, *Bo'sun*, of sailors. *Paille-en-queue*, Seychelles; *Tavaki*, Polynesian islands.

Adult male (Andamans). "Length 30·0 inches; wing 10·75; tail 18·75; tarsus 0·9; middle toe and claw 1·6; bill at front 2·1." (*Hume.*)

Adults (West Indies: Mus. Salvin and Godman). Wing 10·5 to 11·2 inches; tail 18·0 to 20·0; tarsus 0·85; middle toe (without claw) 1·45; bill to gape 2·2.

Iris brown; bill pale gamboge-yellow; legs and feet fleshy, tarsus and base of toes yellowish; tips of toes blackish.

Plumage glossy white, with the following parts black:—a band across the lores continued over the eye and beyond the ear-coverts, a stripe along the median wing-coverts from near the point of the wing to the tertials, the uppermost series of the latter feathers and the terminal portion of the scapulars, a broad stripe down the 1st four primaries from the base to the tip; also the shafts of the primaries and their coverts, of the secondaries and all the tail-feathers, in each case not quite to the tip.

Young. At first naked and then covered with long woolly down, dingy white, sullied with grey on the head, back, and pinions. An example before me, kindly lent by Canon Tristram, has the bill yellow, with black tips; legs yellowish, feet dusky: bill to gape 1·52 inch, tarsus 0·6.

In *immature plumage* it is to be presumed this species is barred on the hind neck, back, and wings like the other members of the genus; but I have been unable to detect any such specimens in collections, and Canon Tristram and Mr. Salvin both inform me that they have never met with the bird in this stage.

Obs. The Red-tailed Tropic-bird may possibly occur on the coasts of Ceylon. Mr. Holdsworth includes it in his list; but I incline to the opinion that the birds he saw belong to the species noticed below. *P. rubricauda* has the bill

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? PHAETHON INDICUS.

(THE LESSER TROPIC-BIRD.)

Phaëton æthereus (Linn.), Hume, Str. Feath. 1873, p. 286; Heuglin, Orn. N.Ost-Afr. ii. p. 1467 (1873).
Phaëton rubricauda (Bodd.), Holdsw. P. Z. S. 1872, p. 482.
Phaëton indicus, Hume, Str. Feath. 1876, p. 481, et 1879 (List B. of Ind.), p. 116; Butler, ibid. 1877, p. 302.

Males (Gulf of Oman). Length (excluding elongated central tail-feathers) 19·85 to 23·4 inches; wing 10·75 to 11·8; tail 7·5 to 10·3; expanse 37·0 to 39·5; tarsus 1·0 to 1·13; middle toe and claw 1·55 to 1·8; bill at front 2·2 to 2·45: weight 1 lb. 1 oz. to 1 lb. 4 oz.—*Female.* Length 24·0; wing 11·7; bill at front 2·4; tarsus 1·0. (*Hume.*)

Iris deep brown; bill dull orange-red, margins of both mandibles, nostrils, and tip dusky; legs and hallux and its web and basal joint of other toes white, tinged bluish and creamy yellow. (*Hume.*)

Plumage white, barred on the back, scapulars, rump, and upper tail-coverts with black; a black crescent in front of the eye, and a narrow black line from the gape along the bill to the culmen; a black line from the posterior angle of the eye running round the back of the nape, the feathers above this collar on the nape with a black bar at the tip; the winglet, the greater coverts of the first five primaries, the shafts and outer webs of these latter feathers, together with a narrow stripe along the shaft on the inner web, black; tertials and their greater coverts black, narrowly margined on the exterior webs and tipped with white; shafts of the inner primaries black at the base, likewise those of the tail-feathers.

Obs. Mr. Hume separates the Tropic-bird inhabiting the Indian Ocean from the larger and widely-distributed species *Ph. æthereus*, Linn., on account of its shorter tail and constant barred plumage, the old birds of the latter, according to Messrs. Finsch and Hartlaub, losing this barring. He unites the birds procured in the Gulf of Oman (of which the above is in essence his description) and those obtained at the Laccadives with the Red-Sea bird, of which the tail-measurement, as given by Heuglin, is 9·87 to 12·61. These measurements slightly exceed the above-quoted, but are not, of course, to be compared with those of the Atlantic and Pacific form, the tails in which I find, on examination of a series in Messrs. Salvin and Godman's collection, vary from 10·0 to 23·0 inches. The constantly shorter tail (and the wing, from 10·5 to 11·2 inches) is perhaps sufficient ground for the separation of the Indian form; but I think the question of the barred plumage is doubtful. I find no *white* birds in Messrs. Salvin and Godman's collection, and the former gentleman tells me he has never seen one. Is it not therefore possible that the Pacific bird spoken of by Messrs. Finsch and Hartlaub may belong to an undiscriminated local form?

I doubtfully identify the Tropic-birds seen by Mr. Holdsworth with this species, as he affirms that they had *white* tails.

Distribution.—This Tropic-bird has been observed by Mr. Holdsworth during his annual cruises off the west coast of

coral-red and the legs yellow. The adult is white, with a black band in front of the eye; the shafts of the primaries and secondaries black, except near the tips; the tertials with a black band down the centre, terminating $\frac{3}{4}$ inch from the tip; shafts of the tail-feathers black, the attenuated portion of the centre pair with the webs red. the centre of the feather black towards the base in continuation of the red; axillaries with a slaty-black central stripe. Wing 13·5; tail 14·4 to 20·0 inches (British Museum). This species is common in the southern parts of the Indian Ocean, breeding at Round Island near Mauritius; it also extends to the tropical parts of the Atlantic, breeding at Ascension Island. It is a straggler to the Bay of Bengal.

Distribution.—Mr. Holdsworth mentions in his catalogue (*loc. cit.*) having seen this bird, to the best of his belief, off the shores of Ceylon. Mr. Bligh, however, had the good fortune to pick up a dead bird on the Galle face in 1870, and preserved the skin. It is an inhabitant of the southern parts of the Indian Ocean, breeding probably at Round Island and Rodriguez, as also in Madagascar; and is not uncommon about the Seychelles, having been met with there by Mr. E. Newton, breeding in the island of Mahé. It strays northward into the Bay of Bengal, and has been got at the Andamans, where Col. Tytler shot a male specimen, which he perceived for some days hovering about a dove-cot in Ross Island, apparently attracted by the white pigeons in it. Further north still, and in a strange locality, a specimen was met with by Mr. Inglis at Dilkoosha, in the north-east of Cachar, about 170 miles from the sea! It was frequenting a river (having probably been driven inland by a storm), and was captured by some native boys! I find no further record of its occurrence within Indian limits than these few instances of stragglers thither; and further west, in the Red Sea, I observe that Heuglin did not meet with it, which shows that its habitat is for the most part south of the Line as regards the Indian Ocean. The above is the only instance of its occurrence in Ceylon.

In the Atlantic it frequents the vicinity of the islands of St. Helena, Ascension, and Bermuda, and is

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Ceylon, and is no doubt a not infrequent visitor to the shores of the island. Mr. Hume procured a specimen about thirty miles from the Cherbaniani reef in the Laccadives, and has met with it along the west coast of India northward to the Gulf of Oman generally, "in a zone between about seven and thirty miles off the shore." In the latter locality he styles it as "not uncommon." Captain Butler met with it in these waters off the Mekran coast between Ormarra and Gwadar. In the Bay of Bengal a species answering to the same description has been seen of late, about lat. 9°, by Mr. Davison; but whether it extends eastward of Singapore I am unable to say. Its head-quarters appear to be the south coast of Arabia, the Gulf of Socotra, and the southern portion of the Red Sea; here Heuglin found it abundant and nesting in the Dahlak archipelago. Southwards it probably extends along the east coast of Africa, perhaps ranging to the Seychelles and Madagascar.

Habits.—This species partakes of the same fearless and inquisitive nature as its fellows. Mr. Hume writes of it:—"They flew about the ship much like Terns, with their longish bills pointed downwards, after the manner of *Sterna caspia*, and seemed totally fearless; in fact were attracted to the vessel by guns which we fired at other birds. They did not, any of them, come very close, not more than seventy or eighty yards as a rule; but they flew round and round at this distance for some time; they were in several parties of from five to twenty." Von Heuglin remarks that they are to be met with either singly or in pairs, but that occasionally they associate in small, though not very sociable, colonies, as the males are of a pugnacious nature. He styles their note shrill, and says that on stormy days they affect the vicinity of cliffs, where they are within reach of shelter, but in clear weather they frequent the open sea. In pairing-time these birds show to advantage, when the males engage in sundry aerial combats, and dash about, pursuing one another with screams.

Nidification.—Von Heuglin found this species breeding in the Red Sea, at the Dahlak archipelago, in June and July. On the island of Sarat el Kebir especially he found many nests in clefts in the rocks, in caves and under boulders; the entrances to the holes were so narrow that it did not seem possible for the bird to pass into the interior. The female lays a single egg on the bare ground or rock at the end of the holes, which were 3 or 4 feet deep, and the nest-cavity was generally behind a corner of rock at the end of the passage, so that the bird could not be seen from without: both sexes appeared to assist in the work of incubation; and in the heat of the day Von Heuglin generally found one of the birds in the hole, in which they lie very close. The egg is described as proportionately large, glossless, and rather more round than elongated; they vary from 25 lines (2·09 inches) to 26 lines (2·15) in length, and from $16\frac{1}{5}$ lines (1·34) to $18\frac{1}{2}$ lines (1·55) in breadth. The ground is a clear grey clay-colour, or a reddish or violet-grey, and the markings consist of dark violet specks and points, over which are larger spots of rusty brown and earth-brown, with occasionally a few blackish streaks; now and then the markings take a zone-like form.

likewise found in the West Indies. In the Pacific it is widely distributed among the islands of Polynesia. Layard records it from Fiji, and it is included in M. Marie's list of New-Caledonian birds. It has recently been procured by a German naturalist, Mr. Hübner, in the island of Eua, whence also Layard obtained its egg. It has also been procured of late in the islands of Ponape and Niwafou; Canon Tristram has specimens from the Samoa group; and Messrs. Hartlaub and Finsch speak of it from the Pelew Islands (where it breeds), from the Stewart group, and likewise from Ualan, one of the eastern Caroline islands.

Habits.—The Tropic-birds are well-known attendants on vessels while passing through warm latitudes, as their inquisitiveness causes them, particularly at nights, to hover about the mast-heads; sometimes they will fly round the vane and now and then peck at it, and on still moonlight nights, in the Indian Ocean, I have seen them sitting on it for half an hour together. The present species does not differ in its nature from its larger and better-known relative, the Red-tailed Tropic-bird; and some of the individuals which I saw about the ship at night during a recent voyage down the Indian Ocean most probably belonged to it. These birds are fearless, and will approach close to a vessel in the daytime. They dwell much on the open ocean, and are possessed of great powers of flight. They usually fly with the bills pointed downwards, often hovering for a while, and plunge rapidly on their prey like a Tern, not immersing more than the head and neck in the water; their plump form and lengthened pointed tails give them a graceful appearance on the wing, and the motion of their wings, which is rapid and regular, adds to the attractiveness of their appearance. Notwithstanding, however, that "Bo'sun" birds are found so much at sea, numbers are resident about the islands where they breed, and there subsist largely on crabs; at sea they are often to be seen dropping on flying-fish, and probably pick up various floating matter, as do Petrels. The name of "Boatswain-bird" is applied by sailors to these birds on account of a fancied resemblance in the tail to a marling-spike, which is one of the most important of a boatswain's stores.

The Boatswain-bird walks with difficulty. Jones, in his account of the natural history of Bermuda, says it "rests its breast on the ground, and shuffles along in an awkward manner, spreading its wings partially."

Nidification.—The nearest nesting-place of this species to Ceylon is probably to be found in the Seychelles group. Here Mr. E. Newton found a nest on Mahé in January; it was situated in a hole in the dead stump of a "capucin," about 15 feet from the ground, and contained a young bird, the produce of the single egg which these species always lay. At Ascension Mr. Gill, as recorded by Mr. Penrose (*loc. cit.*), found it breeding on "Boatswain-bird Island," so called from the large numbers of Tropic-birds which always nest there. It was scarcer than the larger barred species, *P. æthereus*, and was nesting in holes on the side of the island. Like its congeners it is very tame when breeding, allowing itself to be pulled out of its nest, but biting vigorously notwithstanding. An egg which Canon Tristram has kindly lent me for examination has a reddish-white ground-colour, but is so much obscured by the brownish-red stipplings with which the whole egg is covered that it is scarcely visible; round the middle of the egg the speckling is somewhat coarser than at the ends; but at the small end the specks have the appearance of having run into one another, and this part is best described by saying it has a sedimentary look. In shape it is a stumpy oval, much broader at one end than the other, though neither are pointed, but, on the contrary, rather flattened. Its dimensions are—length 2·08, breadth 1·52 inches.

Canon Tristram kindly sends me the following interesting account, which I give here verbatim, of the nesting of this species at Bermuda:—"After a lapse of thirty-four years, Capt. Legge invites me to write my recollections of the breeding of *Phaëton flavirostris* in Bermuda. Premising that I have only the stores of memory, not of note-books, to which to refer, I cannot give exact dates of days of month &c., which, however, have, I believe, been supplied by my friend Mr. Jones, in the 'Naturalist in Bermuda.' All through the winter months and the early spring not a Tropic-bird is ever seen round the islands. They muster, on a sudden, towards the end of April; and then for three months they are *the* ornithological feature of the still vexed Bermoothes. Their arrival is not a silent one. Noisy as Swifts they dash and sweep and sail round cliffs and headlands with their wondrously graceful flight. In a few days they seem to have decided on their respective ledges, much after the fashion of Rooks in an English park. Each pair select a little ledge with a hole in the soft limestone cliff, if they can find one; if not, they content themselves with a shallow scooped niche, always,

however, taking care to have a good platform in front. I have taken the eggs at depths varying from 2 to 4 feet in the rock. The *Phaëton* never appears to lay more than one egg, of a character which clearly separates the genus from all other Steganopodes; and I have observed that, as a rule, the eggs of *P. flavirostris* are more invariably richly coloured, and supply very rarely a pale or shabbily-washed surface, like those of *P. rubricauda*. The female sits assiduously, and is fed during incubation by her mate. The young are naked when hatched, and, to judge by the constant visits of the parents, have a voracious appetite. It is curious to watch the parents clinging to the cliff after the manner of a Swift, and coaxing the young bird forward to receive the little fish from its bill, while her tail is expanded widely against the face of the rocks, the two or three long central feathers forming a fine train. The young are first covered with white down, but the adult plumage is rapidly assumed. When first persuaded to take the water, the young have much difficulty in rising, and I have more than once run them down on the sea and captured them from a sailing-boat. For several weeks they seem to return to their breeding-places to roost, and then, when the nestling down has been all cast, the whole colony disappears on a sudden in August, and not a straggler was ever seen till the following spring. The soldiers were great adepts at capturing them by night on their nests; and my friend Mr. Hendri and myself, having once incautiously offered a shilling apiece for specimens, we were invited next morning by the sergeant to visit the lighthouse on Gibbs's Hill, where over 100 birds were incarcerated in a dark cellar, more than half dead with fright and exhaustion, and an equal number of eggs were displayed on the lighthouse-keeper's table. I speak of more than thirty years ago. But, alas! I am told that whereas formerly the Tropic-birds might be reckoned by thousands, the numbers who return in spring can now be reckoned on the fingers; and Bermuda, as a breeding-place, will soon be among the traditions of prehistoric ornithology."

STEGANOPODES.

Fam. PELECANIDÆ.

Bill straight, the tip hooked in all but one genus (*Sula*); nostrils basal, exceedingly small; throat furnished with a pouch, more or less developed. Wings long, with the ulna much lengthened. Tail moderate, stiff in some. Legs short and stout; the tarsus less than the middle toe, which is shorter than, or only as long as, the outer; all four toes connected by a full web.

Sternum with an open, shallow, and wide indentation on each half of the posterior margin; furcula joined to the keel, which rises from the anterior portion of the sternum.

Genus SULA.

Bill straight, conical, pointed at the tip, which is straight, the edges of the upper mandible near it being serrated; gonys short and pronounced; upper mandible with a narrow groove near the culmen; gape wide, the edge of the upper mandible adjacent to it inflated; nostrils basal, very narrow, and almost invisible; culmen flattened at the base; facial skin and throat at base of bill bare. Wings long and pointed, the first two quills the longest. Tail long and cuneate, varying in the number of feathers. Tarsus shorter than the middle toe, broad and reticulate in front, keeled behind; the outer and middle toe equal, but the middle claw much larger than the outer, and slightly serrated.

Sternum with one wide conical notch in each half of the posterior margin; keel united to the furcula by a close joint.

SULA LEUCOGASTRA.

(THE BROWN GANNET.)

Sula sula, Linn. Syst. Nat. i. p. 218 (1766).

Sula leucogastra, Bodd. Tabl. Pl. Enl. p. 57 (1783); Sclater & Salvin, P. Z. S. 1878, p. 651.

Sula australis, Steph. *apud* Hume, Str. Feath. 1877, p. 318, et 1878, p. 493 (List B. of Tenass.), et 1879, p. 116 (List B. of Ind.).

Sula fiber (Linn.), *apud* Gould, B. of Austr. vii. pl. 78 (1848); Blyth, Cat. B. Mus. A. S. B. p. 296 (1849); Jerdon, B. of Ind. iii. p. 851 (1864); Holdsw. P. Z. S. 1872, p. 482; Salvadori, Ucc. di Born. p. 389 (1874).

Dysporus sula (Linn.), David & Oustalet, Ois. de la Chine, p. 530 (1877).

The Booby of sailors; *Dusky Gannet* of some.

Adult female (Laccadives). Length 31·7 inches; wing 16·1; tail 8·0; tarsus 2·0; bill from gape 5·1, at front 4·1 (*Hume*).—*Adult.* (Pacific) Length 32·9 inches; wing 16·96; tail 8·21; tarsus 1·83; middle toe 2·73 (*Finsch*). (Tenasserim: Brit. Mus.) Wing 16·5; tail 7·0; tarsus 1·86; middle toe 2·95; bill to gape 4·3, at front 3·6. (West Indies: Brit. Mus.) Wing 15·1 inches; tail 8·0; tarsus 1·7; bill at front 3·76. (Locality?: Brit. Mus.) Wing 15·7 inches; tarsus 1·8; middle toe 3·05, claw (straight) 0·49.

Note. This species has 14 tail-feathers.

"Iris white; bill creamy white, with a bluish tinge in veins; pouch, gape, lores, and orbital spaces pale hoary greenish yellow; legs and feet pale yellow, with a greenish tinge on tarsi; claws white, with a bluish tinge" (*Hume*). "Iris very pale yellow; bill and orbits primrose-yellow, blotched before and beneath the eye with pale bluish; eyelash light ash-grey; legs and feet pale yellow" (*Gould*).

Adult (British Museum). Head, entire neck, and upper surface glossy chocolate-brown, paling round the bill in some specimens, whilst in others the head and neck are darker throughout than the back; wings and tail blackish brown; from the chest to the under tail-coverts, including the flanks, pure white, the longer under tail-coverts tipped with brown; axillaries white; under wing brown, with a white band formed by the median coverts.

Young. The nestling is covered with brownish down, darker on the back than on the chest; but when first hatched the young are naked.

Immature (Ceylon). Iris bluish white; bill pale bluish, orbital skin and round the gape tinged with green; legs and toes greenish yellow; webs yellow, claws dusky. Face not bare beyond the posterior angle of the eye.

Entire upper surface, head, and neck, down to the centre of the chest, uniform pale sepia-brown; under surface from the chest pale brownish, defined against the dark colour of the fore neck by a distinct line across the chest; axillaries and a bar across the under wing white; the bases of the feathers of the under surface whitish.

An example received alive in February was in the above plumage, corresponding to other specimens I have examined. In April the head and neck began to darken, blackish-brown feathers appearing among the sepia-brown plumage: at the same time the white feathers of the under surface began to appear, the scapulars and tail-feathers were moulted completely in a month, and in May the under surface was mingled white and brownish; the bird was in bad condition owing to confinement, and was consequently moulting the clothing-feathers slowly and imperfectly; had it been in a state of nature the complete white under surface would have been acquired during the season in question.

An example in the British Museum, labelled "Tenasserim," has the head and neck uniform brown, but the feathers of the back tipped with whitish, conspicuously on the rump, where it forms a whitish patch, and also across the lower part of the hind neck, forming there a pale band; the underparts white, extending somewhat up the middle of the throat; some of the feathers of the fore neck are tipped with white. This specimen is not quite mature.

Obs. This Gannet belongs to a section of the genus *Sula* for which the title *Dysporus* is adopted by some writers; but the type of this genus of Illiger's appears to have been another species with different characteristics, namely the common European Gannet (*Sula bassana*, Linn.): and I agree with Mr. Hume that it cannot well be adopted. The characteristics of the section to which the present species belongs consist in the bare gular skin not extending down the throat as a stripe more or less extended, but terminating in a curve across the chin.

In the Atlantic and on the coasts of South America the White-breasted Gannet assumes a smaller form, which some writers separate from, and others unite with, the present. According to the former, it is the *Sula parva* of Gmelin (Syst. Nat. i. p. 579). A male procured by Von Pelzeln near Rio Janeiro measured—total length only 21 inches.

Distribution.—This well-known bird (the "Booby" of sailors) is a casual visitor to the coasts of Ceylon, being, however, generally seen on the western side of the island. Mr. Holdsworth, the first naturalist to record it from our region, writes thus of it:—"In February and March 1868 I had many opportunities of watching a pair of Boobies which frequented the neighbourhood of the Aripu pearl-banks, about ten miles from the land. They used often to perch on a large iron buoy close to my usual anchorage at night. I only saw them during that one season." In 1871 I saw an example of this species myself sitting on a buoy at the entrance to Galle harbour; and in the same locality Capt. Wade-Dalton, of the 73rd Regiment, has seen several, being likewise the possessor of a specimen which flew against the lighthouse at Galle and was killed. At the latter end of 1875 or beginning of the following year the immature bird above described was captured near Kalutara (Caltura), and kindly given to me by my friend Sir Charles Layard, into whose hands it had passed. A second immature example was seen by me on the 19th December, 1876, flying about the Colombo Roads, and finally settling on the "Drunken-Sailor" buoy near the fort. Since my departure from the island a further example, now in the Colombo Museum, was procured at Kalutara.

This species is widely spread, inhabiting the entire tropical zone, and wandering north and south from it. In the Bay of Bengal Mr. Hume has noticed it, and it is numerous between Penang and Singapore, near the Cocos Islands and Preparis Island, or in that part of the Bay between the Andamans and Burmah. He likewise records it from the Laccadive group, where he saw it at the Cherbaniani reef and near Pere-mull-par. It occurs at the Seychelles, and is occasionally seen as far south as the Mauritius, frequenting also the tropical portion of the east coast of Africa and portions of the Red Sea. In the Atlantic it is found at St. Helena and Ascension, breeding in considerable numbers at Boatswain-bird Island. In the West Indies it has been noticed at the Windward Islands and on the coast of Venezuela; and from Honduras Mr. Salvin records it.

Turning eastward of the Bay of Bengal we find it recorded from Formosa and Shanghai by Swinhoe; and northward of the latter place Père David says he has not seen it, notwithstanding a species of Gannet is included in the 'Fauna Japonica' by Temminck and Schlegel under the name of *S. fusca*, which may have been this species. To the Philippines it appears to be a rare straggler: Cuming procured it in the island of Mindanao; but Mr. Everett and recent collectors have not met with it in this group. It is found among various islands in the Pacific, among which the Fiji group may be mentioned, whence Hartlaub records it. On the north coast of Australia and about Torres Straits it is not uncommon; and I observe that Mr. Ramsay, in his list of Australian birds, notes it from Cape York, the Gulf of Carpentaria, and Port Darwin, as also from the south coast of New Guinea. Salvadori records it from Sumatra, Borneo, Celebes, Ternate, Amboina, and New Guinea; and recently Herr Meyer speaks of a specimen having been brought from Minahassa, in Celebes.

Habits.—This species does not appear to lead the active life which makes the various species of White Gannet so conspicuous; it has not the same vigorous, rapid flight, every now and then plunging from great heights like a thunderbolt into the sea, which, when sailing in the Cape or Australian seas, one cannot fail to notice at once in the case of *Sula serrator* or *S. capensis*; but it appears to fly leisurely along, nearer the water than these its congeners, now and then *sweeping* down after some unlucky fish. While affecting the vicinity of the shore it frequently sits on small rocks or on some isolated buoy, which kind of perch it invariably chooses when it is to be had. Its favourite food in the tropics seems to be flying-fish, which it may often be seen chasing, flying after them and dashing on them in a slanting direction. It not unfrequently comes on board ship at night, perching usually on the extremity of the yard-arm, and while taking its rest

now and then twisting its head stupidly from side to side, which habit no doubt has given rise to its name of Booby among sailors.

The example which I kept in confinement was a greedy bird, snapping up fish and pieces of meat, and devouring them like a Cormorant as rapidly as I threw them in to it. It perched much on an upright stone which I had placed in the ground for the purpose, but now and then it betook itself to a lower perch and sat upright; but sometimes it placed itself in a position of ease by resting the centre of its breast on the stake, and thus balanced its body in a horizontal position, with the neck held out straight. It walked well, taking short strides, but without the waddling gait which one would have expected from the backward position of its legs. Its voice was a hoarse harsh crake, reminding one of the creaking of a heavy gate on rusty hinges! While moulting, particularly when its neck lost many of the feathers, bare places being visible here and there, it seemed unable to swallow, and shook its food out of its bill with a jerking motion of the head; this continuing for some time, it became very dull, and one day, while poking its head through the bamboos into the adjoining aviary, a Sea-Eagle which occupied the next compartment seized it by the neck. After this, though it had really sustained no injury, it pined, and its eyes gradually closed up, until I was obliged to put an end to its unhappy existence.

Dr. Cunningham, in his exhaustive notice of the Common Gannet or Solan Goose (*S. bassana*), says (Ibis, 1866, p. 13):—"The name Gannet is intimately connected with our modern English Gander, both words being modifications of the ancient British 'gan' or 'gans,' which is the same word with the modern German 'Gans,' which in its turn corresponds with the old High German 'Kans,' the Greek *χὴν*, the Latin *anser*, and the Sanskrit 'hansa,' all of which possess the same signification, viz. a Goose."

Nidification.—This widely-distributed Gannet breeds at certain fixed localities throughout the tropical portions of the globe. Its nearest breeding-station to Ceylon may perhaps be in the Malay archipelago; but it is known to nest at Rodriguez, and also in the Red Sea, as Von Heuglin was informed by Arab fishermen that there were colonies on the islands of the Dahlak archipelago; but he did not visit them himself. On Boatswain-bird Island this Gannet breeds in considerable numbers. According to Mr. Gill it nests on the top of this rocky islet, and also on some isolated rocks off the north-west corner of Ascension. The single egg is laid on the bare ground, and is chalky white in colour.

An egg of this Gannet, kindly lent me by Mr. F. G. Penrose, and taken at Boatswain-bird Island, is an oval, somewhat pointed at one end; the exterior of the shell is chalky white and the texture rather smooth; beneath, the shell shows pale green where the chalky material has been scratched off. It measures 2·66 by 1·73 inch. Other specimens, belonging to Canon Tristram, the loan of which I have been favoured with, are of similar shape and texture, but vary in width; two measure 2·4 by 1·5 and 2·38 by 1·57 inch.

SULA CYANOPS.

(THE YELLOW-EYED GANNET.)

Sula cyanops, Sund. Phys. Sällsk. Tidsk. 1837, p. 218; Heuglin, Orn. N.Ost-Afr. ii. p. 1480 (1873); Salvadori, Uccelli di Born. p. 367 (1874); Hume, Str. Feath. 1877, p. 307, et 1879, p. 116 (List B. of Ind.).

Sula personata, Gould, P. Z. S. 1846, p. 21; id. B. of Austr. vii. pl. 77 (1848).

Dysporus cyanops (Sund.), Finsch & Hartlaub, Orn. Centr.-Polyn. p. 252 (1867).

The Masked Gannet, Gould.

Adult females (Raine Island; 'Challenger' Exp.). Wing 15·7 to 16·0 inches; tail 7·0 to 7·5; tarsus 2·2 to 2·3; outer toe and claw 3·5; bill at front 4·1 to 4·2, to gape 5·2.—*Male and female* (Mekran coast). "Length 32·0 to 33·0; wing 16·5; tail 7·25 to 7·5; bill at front 4·0 to 4·06; bill to gape 4·12 to 5·0" (*Butler*).—*Adults* (Red Sea). "Length 30·7 to 31·8; wing 17·8 to 18·1; tail 7·67 to 8·77; tarsus 2·1 to 2·2; bill at front 4·12, at gape 4·93" (*Heuglin*).

Note. This species has 16 tail-feathers.

Iris yellow, reddish yellow, or greenish yellow; bill yellow or greenish yellow; loral and facial skin dark slate-colour; legs and toes dark slaty or plumbeous; webs darker.

Obs. Mr. Hume, in his valuable notice of this species (Str. Feath. 1877), gives a list of the descriptions of the "soft parts" of this species by various authors, to show how much they vary. The discrepancies, however, as regards what are presumed adults, in his table do not appear to be greater than one would expect in the case of birds of perhaps different ages from widely distant localities. The four specimens last in the table are evidently all immature. Mr. Murray, the naturalist of the 'Challenger,' describes the soft parts of the Raine-Island specimen as follows:—"Iris yellow; skin of the throat black; legs and feet slate-colour."

Adult female (Raine Island). Plumage white; the primaries and their coverts, greater wing-coverts and secondaries, as also the tips of the tertials and scapulars, brownish black; inner webs of the secondaries basally white; tail very dark brown, somewhat paler than the primaries, the basal portion of the feathers white, extending along the edges of the central pair; under wing white.

Young. The nestling is covered with white down (*fide* Finsch).

Immature in first plumage. Iris dusky yellow; face and basal portion of bill blue, passing into olive at the tips; legs and feet olive, the webs darker. "Plumage uniform greyish brown" (*Finsch*).

In the succeeding stage the plumage is white, more marked with dark colour than the adult.

The following is a description of an immature example procured in Ceylon in the month of April:—Length 32·0 inches; wing 17·0; tail 9·0; tarsus 1·9; middle toe and claw 4·0; bill to gape 5·3.

Bill blackish at base and tip; the remainder in the dried specimen reddish, probably yellow when living; legs and feet black.

Plumage white, tinged with salmon-colour beneath; the primaries, secondaries, wing-coverts, primary-coverts, scapulars, and tail dull black, the following parts being white, *e.g.* the inner webs of the longer or underlying scapulars, also of the secondaries and the primaries to within 3 or 4 inches of the tips, and likewise the bases of the wing-covert feathers; upper tail-coverts with a drop-shaped black patch near the tips of the feathers.

Captain Butler records the soft parts of specimens in immature plumage shot on the Mekran coast as follows:—Iris pale green (?); bill pale bluish horny; bare skin of face and chin slate-colour; feet lavender-blue. The colour of the iris is here at variance with that noted by any other naturalist; and one is almost inclined to think that the specimens have been wrongly identified.

Obs. Sula piscatrix, Linn., which is found in the Malay archipelago, may perhaps occur as far north as Ceylon. It has the *legs and feet red*; bill and facial skin light blue. Plumage white, with the head and neck tinged with buff; primaries, greater coverts, and secondaries brown, tinged with grey; edge of the under wing brown. Wing 14·5 to 16·4 inches. These notes, except the dimension of the wing, are taken from a Torres-Straits specimen.

Sula capensis, Licht. (the Cape Gannet), is white, with the *entire tail* and the quills and greater wing-coverts brown. It does not appear to stray north of the Mozambique channel. Wing 18·0 inches; gular space extending in a narrow stripe down the centre of the throat.

Sula serrator (*S. australis*, apud Gould, P. Z. S. 1840, p. 177) is a magnificent species, frequenting the Australian seas, and is one of the showiest birds on the wing and boldest fishers of the whole genus. It has only the *four central tail-feathers* and the quills (none of the wing-covert feathers) black-brown. A specimen in the British Museum measures in the wing 17·5 inches.

Distribution.—An example of a white Gannet, which I identify as belonging to this species, was sent home for examination, about a year ago, by the Director of the Colombo Museum. It was brought to him by a native of Puttalam, who stated that he had caught it there in the month of April 1878; and if this statement be correct, the bird was probably driven on shore in a gale of wind. No other example of the species has been, to my knowledge, met with in the island.

This Gannet inhabits the southern parts of the Indian Ocean, and is not uncommon in the Malay archipelago and about the Cocos Islands, whence it wanders north, approaching the Mekran coast, where Captain Butler procured specimens in May 1877. Von Heuglin met with it on the Somauli coast, at Ras Hafun and Socotra, and on the island of Kuria Muria. Captain Shelley includes it in his 'Birds of Egypt,' on the authority of Mr. E. C. Taylor, who met with it near Suez. It is found in the tropical parts of the Atlantic, breeding at Ascension on Boatswain-bird Island, near which place I have seen it in considerable numbers myself.

Eastward of Ceylon it is apparently more abundant, for in the Malay archipelago Salvadori records it from the Straits of Sunda, the coast of Borneo, and Torres Straits; and in the latter locality it was found breeding at Raine Island by the 'Challenger' expedition; while Mr. Ramsay records it from Port Darwin and Cape York, southward of which it extends to the Wide-Bay district, New South Wales, Victoria, and South Australia. It has been found in various places in Polynesia, including the Sandwich Islands, the Paumotu and Phœnix groups, and M'Kean's Island, Gräffe having procured it at the two latter places, and Peale at the second named, while Salvadori records it from the first mentioned. Eastward still it has been noted from Peru and the coast of Chili.

Habits.—This fine Gannet, like the Australian and Cape species, is a showy bird on the wing and possessed of great powers of flight. The only locality where I have seen it myself was at Ascension; and I had there an opportunity of seeing it chased by Frigate-birds, and display all the speed that it was capable of in trying to evade its rapacious adversary. It flies with very rapid strokes of the wings, and keeps at a good height above the water when proceeding from place to place. It descends on its prey almost perpendicularly, and plunges with great velocity into the water, almost disappearing beneath the surface in the force of its descent.

Nidification.—The Masked Gannet appears to have a permanent breeding-station in Raine Island, Torres Straits, as several naturalists have found it there at the nesting-season. Gould describes eggs taken from this place as "rather lengthened in form; dirty white, stained all over with reddish brown; dimensions $2\frac{5}{8}$ inches long by $1\frac{3}{4}$ broad." It likewise nests at Lord Howe's Island, whence Canon Tristram has specimens, one of which, kindly lent to me, is sullied white, with a bluish-green shell, from which the chalky texture has been considerably removed; this is an ellipse in shape, and measures 2·66 by 1·71 inch. In the Atlantic it breeds on the top of Boatswain-bird Island, at Ascension, in company with the Brown Gannet; here its single egg is laid on the ground.

Genus PHALACROCORAX.

Bill with the culmen flat and the tip suddenly bent down perpendicular to the direction of the ridge; a long narrow groove running from the nostril near the culmen to the commencement of the curve; nostrils basal, linear, concealed beneath the loral skin; sides of the under mandible flexible, and only joined at the tip by a bony arch, up to which the gular pouch extends. Wings with the 2nd quill the longest, and the 1st and 3rd subequal, the inner webs of the 1st and 2nd notched. Tail rounded, the feathers very stiff, and the laterals graduated. Tarsus short and much compressed, the inner side with a rim of transverse scales, the front and the outer side reticulate. Toes flattened, the outer longest, much exceeding the tarsus, and with four joints; hind toe reversible to the front.

PHALACROCORAX CARBO.

(THE COMMON CORMORANT.)

Pelecanus carbo, Linn. Syst. Nat. i. p. 216 (1766).

Phalacrocorax carbo (Linn.), Leach, Syst. Cat. M. & B. Brit. Mus. p. 34 (1816); Hume, Str. Feath. 1879, p. 116 (List B. of Ind.); Dresser, B. of Eur. pts. 73, 74 (1879).

Phalacrocorax novæ-hollandiæ, Steph. in Shaw's Gen. Zool. xiii. pt. 1, p. 93 (1825).

Graculus carbo (L.), Blyth, Cat. B. Mus. A. S. B. p. 298 (1849); Jerdon, B. of Ind. iii. p. 861 (1864); Salvadori, Uccelli di Borneo, p. 364 (1874); Hume, Nests and Eggs, iii. p. 659 (1875); Scully, Str. Feath. 1876, p. 204; Oates, ibid. 1877, p. 169; Hume, ibid. 1878 (B. of Tenass.), p. 496.

Corvo marinho, Portuguese; *Aalscholver*, *Schollevaar*, Dutch. *Ghogur*, *Pan-kowal*, *Pan-kowa*, Hind.; *Bonta-kaki*, Telugu; *Khara ghaz*, lit. "Black Goose," Khasghar (Scully); *U*, Japanese; *Aqaq*, Arabic.

PHALACROCORAX FUSCICOLLIS.

(THE ASIATIC CORMORANT.)

Phalacrocorax fuscicollis, Steph. in Shaw's Gen. Zool. vol. xiii. pt. 1, p. 91 (1826); Hume, Str. Feath. 1879, p. 116 (List B. of Ind.).

Graculus sinensis (Shaw), *apud* Blyth, Cat. B. Mus. A. S. B. p. 298 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271; Jerdon, B. of Ind. iii. p. 862 (1864); Holdsw. P. Z. S. 1872. p. 483; Hume, Nests and Eggs, iii. p. 660 (1875); Butler & Hume, Str. Feath. 1876, p. 33.

Graculus fuscicollis (Steph.), Oates, Str. Feath. 1877, p. 170.

The Chinese Pelican, Shaw, Nat. Miscell. xii. pl. 529 (1790–1813).

Brown-necked Shag, Lath. Gen. Hist. x. p. 425.

Adult (India). "Length 24 to 27 inches: wing 11, expanse 36 to 40; tail $5\frac{1}{4}$ to 6; bill at front $2\frac{1}{4}$; middle toe $2\frac{3}{4}$." (*Jerdon*.)

Adult female? (Ceylon). Length 32·5 inches; wing 12·5; tail 6·5; tarsus 2·1; outer toe and claw 3·8; bill to gape (straight) 3·5.—*Adult males* (Burmah). Length 32·0 to 32·7 inches; wing 13·3 to 13·6, expanse 51·0 to 52·0; tail 6·8 to 7·5; tarsus 2·3 to 2·4; outer toe and claw 3·8 to 4·0; bill from gape 3·85 to 3·95 (*Oates*).—*Adult males* (Kashgharia). Length 32·8 to 33·0; wing 13·7 to 14·0, expanse 55·5 to 57·3; tail 7·8 to 8·3; tarsus 2·1 to 2·2; bill from gape 3·8 to 3·9: weight 4 lbs. 10 oz. to 4 lbs. 2·25 oz. (*Scully*).—*Adult male and female* (Wales, ten examples). Length 33·2 to 36·0 inches; wing 13·0 to 14·5, expanse 55·0 to 58·0; tail 6·54 to 7·0; tarsus 2·4 to 2·7; outer toe and claw 3·8 to 4·3; bill to gape (straight) 4·0 to 4·3: average weight $6\frac{3}{4}$ lbs., varying from $6\frac{1}{2}$ to $7\frac{1}{4}$ lbs.

Note. Occasionally very large birds are met with; one was shot some years ago near Aberystwith weighing 10 lbs., and recorded in the 'Field.' The weight given by Dr. Scully is very low.

There are 14 feathers in the tail of this species.

Breeding-plumage. Iris bright emerald-green; loral skin black, extending about 0·2 inch below the eye, from which line to the gape the skin is orange-yellow; gular skin black, with pale yellow specks, or yellow-grey with yellow specks; bill blackish, sides of lower mandible flesh-colour, darkening towards the tip; legs and feet black.

Male (March; Craig y dern, Wales). Head, neck, centre of the interscapulary region, back, rump, upper tail-coverts, entire under surface, and under tail-coverts glossy black, with a greenish hue; a sharply defined white gorget bounding the gape and pouch, and running out into the centre of the latter passes round to the orbital skin, terminating there, its general width being about an inch; down the centre of the occiput and nape there is a line of elongated feathers about $1\frac{1}{2}$ inch in length, forming a comb-shaped crest; the front of the crown, as also the sides (leaving a narrow streak down the centre of the occiput, on which the crest lies, and a broad space above the eye, which passes down beneath the gorget), together with the hind neck and throat for a distance of about 5 inches down, are overlaid with a close striation of narrow, silky, filamentous white feathers; the feathers of the shoulders, sides of the chest, the scapulars, tertials, and wing-coverts glossy brownish bronze, with clearly defined black margins and black shafts; primaries black, pervaded with grey; outer webs of secondaries bronzed greyish, with black edges, inner webs blackish grey; tail black, the shafts of the feathers grey; overlying the thighs a conspicuous patch of white feathers; under wing black.

In Great Britain and probably throughout temperate Europe the silky neck- and head-feathers, together with the white thigh-patch, are donned in February and put off again in May; out of hundreds of birds which I closely examined in Wales in June very few had the thigh-patches left, and not very many had more than a few scanty white filaments round the throat; none had any on the head, as these commence to be shed first, and are all gone by the middle of May; at the same time the white gorget undergoes an almost complete change of colour, becoming brownish grey above the gape and round the edge of the black; this is acquired by a moult, but also, as far as I can observe, by a change in the colour of some of the feathers; the chin remains white.

Obs. A specimen which had perhaps acquired this plumage unusually early has probably led Mr. Dresser to figure this dress as the *winter plumage*!

Note.—This species has 12 tail-feathers.

"Iris verdigris-blue; nude orbits black; bill dusky brown, reddish beneath; gular skin yellow; feet black."

Winter plumage. "Head and neck shining black; feathers of the back and wing-coverts bronze-colour, as in the last; throat white, this colour extending towards the eye, and passing into pale brown on the cheeks; lower plumage deep black."

"In *breeding-plumage* this Cormorant assumes some white specks on the forehead and above the eyes, and a white tuft behind each ear: the chin, however, is then black." (*Jerdon.*)

Immature (Mt. Aboo, May). "Length 24·0 inches; wing 9·75; tail 5·5; bill at front 2·25, to gape 3·0.

"Iris green; upper mandible greenish black; lower mandible fleshy.

"Upper parts brownish black, slightly glossed with green; scapulars and lower hind neck silvery earthy brown, having many of the feathers, especially of the scapulars, bordered conspicuously with brownish black and finely edged with pale brown; wings and tail dark; wing-coverts brown, glossed with green; chin and upper throat

In Burmah, where this species breeds in large numbers, the white flank-spot is said by Mr. Oates (and, I apprehend, the filamentous feathers too) to be acquired in September (the eggs being laid in October) and doffed again in the beginning of December. In the north-west of India, Mr. Doig saw many specimens which had lost the white neck-plumes in November, but still retained the thigh-spot. A specimen shot in January at Jaffna has the neck, but not the head, covered with the white feathers and a scanty white flank-spot; from the distribution of the remaining feathers they are apparently being doffed, and not donned, so that the bird would appear to have bred at some place not far distant.

After the disappearance of the white neck- and flank-feathers the ground-colour of the pouch appears to get paler, and the entire skin becomes yellow, these differences constituting the *winter plumage*.

Young (callow nestling males). Skin blackish slaty, the crown reddish, but the skin round the closed eye bluish, with a dark streak over the eye; bill—upper mandible dusky fleshy, a *white* spot at the curve of the tip, behind which there is a black patch; tip of the under mandible blackish, the remainder with the pouch yellowish fleshy; legs and feet fleshy yellow, the claws black; the tibial skin concolorous with that of the body.

In about a fortnight the young are covered with down. The iris is then grey, tinged with greenish; forehead naked, the skin bluish or fleshy grey; the culmen and edge of lower mandible black-brown, the tip pale fleshy; remainder of bill fleshy, yellowish next the pouch, which is fleshy yellow; front of tarsus and top of toes dark brown; rest of legs and webs fleshy yellow. The down is sooty black above and beneath; occasionally individuals have patches of white down on the under surface. At this period the young are about the size of a small Duck, but the body is longer. The average weight of six examples was $2\frac{1}{2}$ lbs., some weighing as much as $2\frac{3}{4}$ lbs.

On leaving the nest the bird is in the plumage of the first year, during which period the full dimensions are attained. Examples in the flesh, about one year old, measured—Length 35·5 to 36·0 inches; wing 13·5 to 14·0, expanse 57·5; tarsus 2·5; outer toe 4·5; bill to gape (straight) 4·2 to 4·5; weight of a male 7 lbs.

Iris pale grey, sometimes tinged with greenish; orbital skin brownish yellow; loral skin dull greenish yellow; gular pouch entirely gamboge-yellow; bill as in the adult, as also the legs.

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white; neck mottled brown and white; from neck to vent brownish black, with a good deal of white on the breast and abdomen, the latter almost all white in the region of the belly; thigh-coverts, like the back, black, glossed with green; lower tail-coverts dark brownish black; under wing-coverts and flanks brownish black." (*Butler.*)

The *nestling*, as in the last species, is in all probability covered with blackish down.

Obs. Never having procured this species while in Ceylon, and being unable to detect specimens in the British Museum, or in any collections to which I have access in England, I have been, I regret to say, obliged to transcribe the entire descriptions from the writings of other naturalists. There is a mounted specimen in the British Museum of an immature Cormorant, of rather diminutive size, from China, which at first sight might be taken for the present species; but it is, in my opinion, merely a rather small example of the last. The wing measures 12·8 inches; tail 7·0; bill to gape 3·5; tarsus 2·0. Neither Swinhoe nor David include this species in the avifauna of China, and it is therefore probable that the *P. sinensis* of Shaw was nothing more than the Common Cormorant.

Distribution.—This species, so far as I could ascertain, is a rare bird in Ceylon. Layard remarks that he *saw* a few on the fishing-kraals in the Jaffna estuary in company with the next species. Mr. Holdsworth did not meet with it at all; and although I have seen at a short distance a few birds which I identified at the time as the Lesser Cormorant, I have never shot it. On one occasion I met with a pair of Cormorants which were perched on stakes in the Tamara kulam, near Trincomalie, which were intermediate in size between the large and small species, and which were near enough for me to discern that they were in immature plumage; at other times I have seen similar birds in one or two tanks in the interior; and I have no doubt that they all belonged to the present species. It is well to remark, with regard to Layard's identification, that the birds he *saw* on the *estuary* (salt water) near Jaffna may have been examples of the Common Cormorant, which was at that time not known to visit the island. As I cannot ascertain that specimens have ever really been procured, I place this species in a footnote article.

Jerdon speaks of this Cormorant being equally widely distributed in India with the last, and even more generally spread than that species, he having procured it in the Carnatic, Tickell in Central India, and Blyth in Bengal and Burmah. Mr. Hume, however, writing in 'Nests and Eggs,' takes exception to this statement, and at the time he writes

A Ceylonese example (January) is as follows:—Head, neck, and throat brownish black, darkening to black, glossed with green, down the centre of the hind neck; the feathers of the head narrowly edged with greyish buff, the edgings increasing in width on the sides of the upper neck and down the throat, where the bases of the feathers are pale tawny; the broad white gorget extends up to the ear-coverts, where it darkens into pale brownish, and round the lower edge it blends into the dark colour of the throat; the back and rump are black, as in the adult; the light scapulars, interscapulary feathers, and wing-coverts are pervaded with grey, some of them having a dull bronzy tinge, and the margins are not so intensely black as in the adult; the quills are the same; flanks and sides of the breast black, glossed with green; the centre of the breast and chest are mixed blackish brown and whitish, tinged with ochreous, the tips of the feathers only being blackish, and the remainder ochreous, passing into white at the bases; under tail-coverts greyish, margined with black; on the upper hind neck and about the head there are a few white "points."

An example shot in Wales in October, probably in the 2nd year, is much blacker on the head and down the hind neck, the pale margins being very fine indeed; the scapular and wing-covert feathers are more bronzed in colour, but they extend, as in the immature Ceylonese specimen, higher up the hind neck than in the adult; the fore neck is darker, but the centre of the under surface is whiter than in the aforementioned specimen; the nape and upper part of the hind neck and its sides are striated with very fine white filaments, which would therefore appear to be put on in the second winter, irrespective of the larger white plumes, which would be donned in the following February with the black plumage; on the thighs there are indications of white patches in the shape of a few small short white feathers. I have seen numbers of examples shot in June (just one year old in Wales) without a sign of any of these small white feathers on the neck or thighs, so it is clear they are not assumed until the second year; and then they are not of the same character as those of the breeding-plumage, which is, as far as I can ascertain from numerous observations made in Wales, put on, but perhaps not in all cases, in the second March by birds hatched in May and June.

Obs. As will be observed, this species varies considerably in size, the smallest race existing in India and China.

(1875) says that he had never seen a live specimen nor a skin ever from the north-western parts of India (Sindh, Rajpootana, &c.). He records it, notwithstanding, from Lower Bengal and the countries eastward, and from Jhansi, where Mr. Blewitt found it breeding. In Chota Nagpur Mr. Ball met with it at Lohardugga and the Rajmehal hills; and in the above-mentioned region, from which Mr. Hume excludes it, it has been observed by Captain Butler at Mount Aboo and in the plains of Guzerat; whilst Mr. Doig found it breeding on the Eastern Narra river in Sindh. In the Deccan Mr. Wenden observed it at Nulwar, and he thinks he saw it again in Sholapoor.

To the eastward of Bengal it is found in Burmah on the Pegu plains, and is there, according to Mr. Oates, as common as the larger species; in Tenasserim it is local, occurring only on the tract between the Salween and the Sittang.

As above remarked, I find no recent mention of its occurrence in China, and it is therefore uncertain whether its range extends eastward of Burmah.

Habits.—This Cormorant affects tanks, jheels, and large rivers more than the sea-coast; in fact all mention of occurrence in the various parts of India which it frequents relates to its being found on fresh water, and not on salt. It is said by Jerdon to be "generally met with in pairs or alone, but occasionally in flocks."

The examples I saw at Tamara kulam were drying their outstretched wings in the usual manner after fishing, and had taken up a safe position well out of shot; but, notwithstanding, on my emerging from the jungle they flew off, thus demonstrating their shyness.

Nidification.—In Burmah Mr. Oates found the Lesser Cormorant breeding in reeds in the Myitkyo swamp. At the latter end of July nearly all the nests had young birds, so that the nesting-time appears to be late in June. The nests were, writes this naturalist, made of the smaller side branches of reeds, and were flat at the top, converging to a point below; they were about 9 inches across and 6 deep, supported on a few bent reeds. The eggs were five in number, and resembled in colour those of the other species in India. Dimensions 1·92 to 2·15 inches in length by 1·27 to 1·4 in breadth.

Mr. Blewitt found this species breeding in low trees in flooded land in the Jhansi district; the nests were made of sticks, and contained four or five eggs; the average size of those taken was 2·1 inches by 1·4.

Mr. Dresser considers that American birds exceed European ones ; but the dimensions he gives of Bay of Fundy specimens (wing 14·4 inches, tail 8·0, tarsus 3·0, culmen 3·45) are, as regards wing and bill at any rate, by no means excessive.

Distribution.—The Common Cormorant is, I think, a more frequent visitor to the island of Ceylon than has been supposed, and, though it may not breed there, remains apparently (perhaps as an immature or non-breeding bird) during the entire year, as I have seen very large Cormorants, larger to the eye when seen at some little distance than the smaller species, on the Minery and Amblangoda lakes during the south-west monsoon. It has not been hitherto included in the Ceylon lists, but is, I am told, not uncommon during the cool season on the Jaffna estuary or lake, whence I possess fine specimens shot by Mr. Clarke and kindly given me by Mr. W. Murray. If the bird is as common on this lake as has been represented to me, it is no doubt to be found in other situations in the north, probably on the Palverainkadoo and Mullaittivu lagoons.

According to Jerdon it is found throughout India, but rare towards the south, being there found chiefly in rivers that run through forest; in the north it is more common, he observes, especially in Bengal and on the rivers within the Himalayas. In Nepal I find Dr. Scully says it is found on the Trisul Ganga in November; and Mr. Brooks met with it above Mussooree. It appears not to be recorded from the Deccan by any observer of late; but further north and to the east it is found in Chota Nagpur on both jheels and rivers: Mr. Ball notes it from the Rajmehal hills, Lohardugga, and Sirguja. It does not appear to inhabit the neighbourhood of Calcutta nor the district of Furreedpore. But turning westward, I find that it is found in the Allahabad district, probably breeding there, and is common in suitable localities throughout the Sindh, Jodhpore, Guzerat, and Kattiawar regions, and that, as regards the province of Sindh, it abounds on the Muncher lake and on the Eastern Narra; furthermore Mr. Hume noticed it all down the rivers Indus, Jhelum, and Chenab, to Kurrachee, whence along the Mekran coast it was found very plentiful. At the Sambhur Lake Mr. Adam notes it as rare; and in Guzerat Capt. Butler says it is only a cold-weather visitant. Passing now beyond the Bay of Bengal, it is said to be common by Mr. Oates in the streams of the Pegu plain, though not noticed on the Pegu river; it breeds in vast numbers also in the Myitkyo swamp. Further south in Tenasserim it is local, being found only on creeks between the Salween and the Sittang, westward of the latter stream, and also on the Tavoy river. It does not inhabit the Andamans or Nicobars; but it is recorded from the island of Sumatra, and is doubtfully included by Salvadori in the avifauna of Borneo.

Beyond the Malay archipelago, in which, as a whole, its distribution seems as yet to be imperfectly worked out, it extends to Australia, New Zealand, and Tasmania, if we accept the verdict of Messrs. Finsch and Schlegel that the antipodian bird is the same as ours. It occurs at Cape York, down the east coast to New South Wales and Victoria, and in Tasmania is very abundant, ascending the large rivers to the lakes, where Mr. Gould says it breeds. In the latter I have met with it on inlets and brackish lagoons. It is abundant in Western Australia, and in New Zealand is common on the coast and in tidal rivers. Turning now to the north, we find it recorded as common on the coast of China and in Formosa, but only found in the south in winter. Père David notes it likewise from the rivers in the interior. Further north it has been obtained on the coast of Mantchuria, and extends up to Kamtchatka; in Japan it is very common on the coast of Yezo, and was found by Messrs. Blakiston and Pryer in great abundance at Tokio, as also far inland on streams in Yamoto. In Eastern Siberia it is plentiful in parts, though not so on the Upper Amoor; it breeds on Lake Baikal, and appears on the rivers as soon as the ice breaks up. It is numerous in Dauria, and in Mongolia is abundant in the Hoang-ho valley and on Lake Dalai-nor. It arrives, says Prjevalsky, at Lake Hanka in March, and in Koko-nor at the same time. In Kashgharia, however, it is a permanent resident, writes Dr. Scully, who found it in August affecting mud cliffs at Tungtash in small parties; and in Turkestan Severtzoff says it breeds in the north and north-west, but occurs on passage only in the south-west. In Southern Persia Major St. John met with it abundantly on lakes and rivers; and Mr. Blanford says it is plentiful on the Caspian. On the coasts of Asia Minor it is also found, and in Palestine is abundant on the sea-board, according to Canon Tristram, visiting likewise the mouth of the Jordan.

In Greece it is very common, and breeds abundantly, write Messrs. Elwes and Buckley, on the Bosphorus and Sea of Marmora. On the northern shores of the Black Sea and on the Sea of Azoff it likewise breeds, and occurs, according to Artzibascheff, a Russian naturalist, in incredible numbers at the mouth of the Volga.

In Central Russia it is a bird of passage chiefly, passing northwards to the White Sea, breeding there numerously, and likewise occurring in Finland and on the Baltic coasts. In Sweden Nilsson says that it is found in autumn and winter. Mr. Robert Collett informs Mr. Dresser that it is common on the Norwegian coasts, but occurs most numerously above the Arctic circle. Faber writes that it breeds in the north of Iceland; and in the Faroes it is common and resident. In North Germany it is plentiful; but it is less abundant in Poland than formerly. In Denmark Mr. Collin states that it used to nest in forests near the sea, but being so destructive to the fisheries it is now exterminated in many places, still retaining its hold, however, in some localities; it is, however, only a summer visitor to that country, although stragglers are said to remain on water which is open in winter. In Holland it used to be abundant; but since its favourite resorts have been drained, it has disappeared from there, and is only found in a few localities.

In Great Britain it is very abundant, frequenting the entire sea-board up to the extreme north of Scotland, and thence to the Hebrides and the Orkneys and Shetlands. Here and there, however, it is found in much greater abundance than in other places, keeping to a certain extent near its breeding-places, which are always situated near good fishing-grounds. It is, perhaps, on the whole less numerous on the east coasts than on the west, the latter furnishing it with better shelter and more numerous breeding-places. It used to breed at Flamborough Head; but Mr. Dresser states that it has been driven away from that station, and does not nest nearer to it than the Faroe Islands. It is plentiful on the Welsh coasts, and also on many parts of the Irish sea-board.

Turning towards Southern Europe I find that it is said to be partly migratory to France, but breeds at Boulogne and Dieppe. In Southern Germany it is also found, but not in abundance; it appears every spring in Bohemia, writes Dr. Fritsch in the 'Journal für Ornithologie,' but it is not allowed to settle there, so destructive is it to the fish. In Spain and Portugal it is common on the coasts, and also on some of the rivers; but it is chiefly a winter bird. In Sardinia Mr. Brooke says it is extremely common on the rocky parts of the coast, and in Malta and Sicily is also plentiful; but in the former island Mr. Wright says it is chiefly a winter visitor. It occurs in Tuscany, which is one of the comparatively few places where it breeds on trees, but throughout Italy is found chiefly, according to Salvadori, in autumn and winter. In Transylvania it is principally seen on the larger rivers in winter, and occurs on the Danube from Austria down to its mouth.

Passing now to the continent of Africa, I find Favier, as quoted by Col. Irby, stating that it is found on the coast of Morocco, as also on lakes and rivers, from December until February; it is, however, said by Loche to be resident in Algeria on large lakes. In Egypt it is, says Capt. Shelley (B. of Egypt, p. 295), very plentiful, and is more numerous on the Nile in winter than later in the season. Von Heuglin states that it leaves the Nile in March, that it is very abundant in Central and Upper Egypt, and not found south of Assouan. Its occurrence in South Africa does not appear to be perfectly substantiated, for Mr. Dresser states that the specimens Layard refers to in his 'Birds of Africa' prove to be the allied species, *Ph. lucidus*; Mr. Andersson, however, in the 'Birds of Damara Land,' says that it is not rare in Walwich Bay; and if so, there is no reason why it should not extend to the Cape.

Lastly, the Cormorant is an inhabitant of the Atlantic coasts of North America. It is tolerably abundant in Greenland, being found on both coasts, and it extends from Hudson's Bay down to the coasts of Georgia and Carolina. In the Bay of Fundy Mr. Dresser found it common, and he remarks that further south in the States it penetrates as far inland as the Missouri.

Habits.—In the tropics, where the haunts of the Cormorant are mostly in wild country or on unfrequented shores, it is not such a well-known bird as in Great Britain, where its gaunt figure is in many parts quite a feature of the coast-scenery. It is essentially a sea-coast bird, living principally on salt-water fish, but nevertheless frequenting rivers and lakes which abound in fish in the vicinity of the sea, where, when its numbers are great, it creates most serious havoc among the finny tribes. In India and Ceylon it is to be found on jheels, lakes, swamps, and large rivers, as well as on estuaries, harbours, and the open coast. The most notable feature in the economy of this Cormorant is its extraordinary voracity and its remarkable digestive powers. It is a most expert diver, disappearing instantaneously beneath the surface without making any splash at all, and once under water pursues its prey with great speed, using its wings half extended and taking short quick strokes. In pursuing a wounded bird up the arm of a shallow brackish lagoon I have had a good opportunity

of seeing the Cormorant using its wings in this manner, by which it kept ahead of the boat, which was going as fast as one man could row it. It sallies out early in the morning, and commences to fish at once; and in the summer may be seen digesting its food, resorting to favourite and safe perches on isolated rocks, as early as seven o'clock. At this time, when gorged with fish to such an extent that locomotion is a somewhat arduous matter with it, it may be approached more nearly than at other times. It sits resting on its tail, which is always used for that purpose, with its head drawn in, and every now and then extends its neck suddenly, in order to force the fish further down its gullet. After having been at rest for some time, it stretches out its wings, and keeps them extended until they are dried. In the afternoon it commences to fish again, and before retiring for the night to its accustomed roosting-place makes a very heavy meal. One which I saw killed on the Welsh coast at sundown disgorged five rock-perch, two of them weighing half a pound, a fair-sized eel, and a young salmon. I have myself taken gurnet 8 inches long from their throats, and have known a Cormorant (which was shot in the act) at Craig y dern to pursue a salmon of about 3 lbs. in weight. Some idea of the enormous quantity of fish which must be consumed by a large colony of these birds may be arrived at by taking their number at 100 pairs, and assuming at the very lowest that each bird takes 4 lbs. of fish in a day; this will give, as the prey of 200 birds, 800 lbs. in a day, or more than 122 tons in the year. Were it not for the wonderful digestive powers of this Cormorant, it could not dispose of such quantities of food; but so rapid is the process of digestion, that fish when only just passed into the upper part of the proventriculus, or the portion of the stomach just beneath the "crop," are found broken up into small pieces by the action of the gastric juice.

Besides acting as a prop for the bird when sitting upright on a rock or ledge of a cliff, the rigid tail of the Cormorant serves the purpose of a powerful lever in the water, enabling the bird to ascend or descend in deep water by a stroke upward or downward, as required. The Cormorant perches with its bill pointed upwards, and when watching the approach of its enemy, man, twists its neck from side to side, looking over its back in an awkward manner; on flying off from such a situation it proceeds easily, taking quick strong flaps; and soon the momentum of its heavy body carries it forward with great speed; its neck is carried stretched out as a rule, particularly when flying along the water or before alighting on a rock, but not unfrequently, when descending from an altitude to a fishing-ground, it draws back its head, like a Heron. From the water it rises with difficulty, flapping along for some distance before it can mount into the air. Normally it is quite a silent bird, but in the breeding-season has a variety of notes, which I will presently notice. Cormorants roost always in the same place, and may be shot by watching beneath the cliffs to which they fly at sundown, coming in from all directions, and keeping usually at a considerable height. The immature birds are to be found at these localities while the adults are away at their breeding-colonies. In former days these birds used to be kept in England for fishing-purposes; and an instance of a royal Cormorant-fancier is to be had in Charles I., who, Sir Thomas Browne tells us, was supplied from the tree breeding-place at Reedham, in Norfolk. In China they are still used by the inhabitants for fishing; a ring is placed round the neck to prevent the fish being swallowed; but when a sufficient quantity have been caught, the ring is removed and the bird allowed to fish for itself. Père David, who refers to these birds being so tamed in China, says that the Chinese breed them in captivity, hatching the eggs under hens. In countries where the Cormorant is not molested it becomes very tame. Prjevalsky speaks of it as such in Mongolia. In most regions, however, it is a very shy bird, as it is so much persecuted on account of its poaching tendencies; indeed it is one of the few birds not included in England under that most praiseworthy enactment, the "Sea-fowl Preservation Act." In order to enable it to seize large fish the Cormorant is possessed of great strength of bill, and inflicts a serious injury if, when wounded, it contrives to seize the hand with its sharp mandibles; its assault is aggravated by its always shaking whatever it has hold of, just like a terrier shakes a rat. In this way I have known it pierce a man's hand to the bone. It is worthy of remark that in the autumn it is often infested with ticks, which fasten on its head and neck.

I conclude this notice of the habits of the Cormorant with an extract from Dr. Saxby's excellent account, in the 'Birds of Shetland,' of the behaviour of a tame example, and which I take from Mr. Dresser's work. After speaking of the extreme docility and remarkable amount of intelligence displayed by his pet, he proceeds to speak of his voracity, remarking that when "Ducks were fed he would rush boldly in among them and appropriate any thing in the shape of fish or flesh that happened to suit his fancy; but he never would eat

salted food. Sometimes, also, when he saw a boy coming to the house with fish he would waylay him, and, if no contributions were then offered, he would speedily settle the matter by helping himself. One day, when food was scarce and he had been fasting for many hours, I happened to pass by carrying a number of Starlings, one of which I tossed at him, but scarcely with the expectation that it would be accepted. However, he caught it cleverly before it could reach the ground, and the next instant it disappeared down his capacious throat. Another followed, and was treated in the same way; then more, until no less than five had been thus disposed of. This number seemed to satisfy him; and, the whole neck being enormously distended, it was with difficulty that he waddled away to his favourite corner of the coal-shed, where I left him sitting, face to the wall, upon a lump of coal, the legs of the last Starling still projecting from the corner of his mouth. After this a bird was always a favourite morsel, and he would follow me for a long distance when I happened to be carrying a gun. Once I gave him, for a single meal, two Buntings, a Twite, a Sparrow, two Snow-Buntings, and a Ringed Plover; and even then he followed me for more. Birds, fish, and mice were always swallowed head foremost. During the first two years he kept almost entirely to the ground, only occasionally sitting upon a stone or low wall; but afterwards the roof of the house was preferred, from which elevated position he used suddenly to pounce down, either to rob a fish-basket or to scatter a company of feeding Ducks. But this was merely as a diversion, not as a necessity; for from the time of his first taking up his position on the roof he also began regularly to procure his own meals, flying to the voe for that purpose, and after remaining there for an hour or two, returning to his former station by the chimney."

Nidification.—In India the Cormorant nests frequently in trees growing in inaccessible swamps and jheels; but in temperate climates generally resorts to high cliffs or rock-bound shores, where it is safe from the attacks made upon its eggs and young. Mr. Hume has been informed that it breeds on rocks in the river Jumna near Allahabad, and also on the Chumbul near Etawah. Mr. Oates, however, gives us an authentic account of a vast breeding-place in the great Myitkyo swamp in Burmah, where it nests in "low, apparently dead, trees which rear their heads 15 or 20 feet above the water." He was unable to reach the trees himself, and sent a native to procure the eggs. "At a short distance the nests," he remarks, "appeared to be made of twigs; but I have often seen these birds dive in the canal and fly off with weeds fully 5 feet long. These no doubt enter into the composition of the nest." The eggs were taken on the 4th of October; but he observed birds carrying sticks and weeds up to the 27th of that month. His specimens measured 2·3 to 2·6 inches in length and 1·5 to 1·7 in breadth.

In parts of Europe this bird breeds on trees; and an account of a very large colony, situated on an island in the Klossowski lake (North Posen), is given by Mr. Dresser from the letter of a correspondent, Dr. Kütter. Here about 400 pairs breed in lofty fir and oak trees in company with about 200 pairs of Herons. A description of a large breeding-place at the Samara-Dhund swamp in the Eastern Narra district, where the nests are all placed on trees only 4 or 5 feet above the water, is also given by Mr. Doig, C.E., in 'Stray Feathers,' 1878, p. 468. The nests were large platforms of sticks, the eggs being laid on a thin bedding of grass. In one nest there were as many as seven eggs. In Denmark, as has been already stated, it used to breed in the forests near the sea, and about a dozen localities are cited by Mr. Collin from which it has now been driven. Finally, there was, in former centuries, the breeding-place at Reedham above alluded to. Now it is known to breed only on sea-cliffs, on rocks and precipices, on the borders of lakes in Scotland, or on crags near the coast, as in Wales. The most celebrated breeding-place in the latter country is that known as Craig y deru (the "Bird-rock"), in Merionethshire, which, through the kindness of the owner of the estate, Major Stewart, of Shrewsbury, I was enabled this year to visit. The "Bird-rock" is one of the buttresses which flank the south side of a pretty valley running up from Towyn to the sides of Cader Idris, and is situated about seven miles from the sea. A walk of two miles and a half across the flat country near Towyn, past the gates of the fine old seat, Ynys Moengwyn, brings the pedestrian to the foot of the hill which divides the two valleys intersecting this part of the country; and after bearing to the left, the road leads along the slope of the dividing range, and the breeding-place of the Cormorants opens out. It is a bold crag of trappean rock with two faces, the western tumbling down to the fields below in lumpy masses and steep grass- and bracken-slopes, the northern a sheer precipice of 300 feet, supported by a grand slope of fallen rock and earth about 400 feet in height. A few Cormorants were seen wending their way in from seawards high above our heads, and now and then one

launched himself out from the dizzy height, and after circling over the field below returned to his perch beside his nest; but, further than this, we saw no signs of the colony till we rounded the corner formed by the two faces of the rock, when suddenly burst upon us the lofty precipice, with its pinnacles standing out from the main mass and its whitened ledges, on all of which sat rows of glossy Cormorants, writhing their long necks, while the clanking notes (*kliōi-ink, kliōi-ink*) of the young birds crying for food made the rock resound again. We had not long commenced to ascend the steep slope towards the foot of the crag when a pair of Peregrines darted out, one mounting far above the rock, and the other commencing her harsh note, *kra, kra, kra, kra,* which it kept up as it flew round and round for five hours incessantly. The eyrie was about 100 feet from the top of the crag, and directly above, on the very top of the rock, we found the spot strewn with the remains of young Cormorants, Jackdaws, small birds, &c., where the meals of the young Peregrines were prepared. Now and then a Cormorant, launching himself from the rock, would pass rather too near the nest, and the Falcon would swoop at him, making him emit a hollow bellowing sound like *kiōōong.* There were about 80 pairs of Cormorants nesting here, and at the time of my visit (5th of June) most of the young were hatched out; but some eggs obtained were almost fresh. The nests were situated mostly on slanting ledges of about 3 feet in width, or in nooks in the precipice; but many were on the very summit of detached pinnacles, from which, as the gamekeeper who accompanied us said, many nearly full-grown young fall and are killed. They stand round the edges of the nest for some time before they are taken down to the water by their parents, and probably in fighting with one another get pushed off the pinnacles. The nests were nearly all constructed of stems of the bracken-fern, plucked from the hill above the crag; they measured about a foot in internal diameter; and the young, which were mostly three in number, sat with their heads pointing in the same direction. When returning from the sea to their young, or when coming back to their nests after being fired at, we always knew when the birds intended to alight by their spreading out their tails and stretching out their legs and huge feet almost at right angles to their bodies for about 50 yards from the nest, on arriving at which they uttered a loud guttural *glock, glock, glock,* which was answered by the other bird, were she on the nest, by a somewhat different note, like *goik, goik, goik.* My companion, an intelligent bird-stuffer and "naturalist" of Aberystwith and a crack shot, had brought with him a powerful 10-bore gun so as to procure specimens; on a bird being fired at numbers of its companions would launch out into the air, but after flying round for a few minutes would come back a dozen at a time with a booming sound, like the rushing of the wind in a vessel's rigging. Others sat still and did not move, and while some of the nests were being robbed many sat complacently watching us only a few yards distant. I was struck with the extraordinary vitality of some of the birds, which, when picked up, were found to have been shot right through: they flew steadily out from the top of the rock, many hundreds of feet above the fields below; and as we watched them, looking towards the beautiful woods of Peniarth-achaf, the seat of Major Stewart, we observed them begin to quiver now and then, the motion of the wings becoming slower; then a sudden dip, followed by a few spasmodic flaps, told us that all was over; the birds would commence to descend rapidly, and spinning round and round through 800 feet of space, fell to the ground with a thud that we could hear from our elevated position. The young when taken from the nests stretched out their necks constantly and expanded the muscles of the pouch, at the same time quivering their heads. They are fed with digested food when quite young. The eggs we took are long, nearly perfect ovals, slightly pointed at one end, and are covered with a moderately smooth chalky coat of varying thickness, which in many places comes away in large patches (most probably scraped off by the bird's feet when newly laid) and discloses the bright sea-green under-shell. Examples measure 2·43 by 1·52 inches, 2·62 by 1·61, 2·43 by 1·6, 2·54 by 1·57, 2·65 by 1·61, and 2·68 by 1·63.

The young are conveyed down to the water on the backs of their parents, which interesting performance may, I am told, frequently be witnessed at the Craig-y-dern rock.

Since this article went to press, my friend Mr. Seebohm informs me that he visited an extraordinary breeding-place of the Cormorant, between Amsterdam and Utrecht, this summer, where a large colony were breeding *on the ground* close to a sheet of water; there were about 200 nests in a space of about 15 square yards; they were piles of sticks from one to four feet high, looking as if a new nest was made every year.

PHALACROCORAX PYGMÆUS.

(THE LITTLE CORMORANT.)

Pelecanus pygmæus, Pallas, Itin. ii. App. p. 712 (1773).

Carbo javanicus, Horsf. Trans. Linn. Soc. xiii. p. 197 (1821).

Graculus pygmæus (Pall.), Blyth, Cat. B. Mus. A. S. B. p. 298 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 272; Von Heuglin, Orn. N.Ost-Afr. ii. p. 1491 (1873); Legge, Ibis, 1874, p. 27, et 1875, p. 409.

Graculus javanicus (Horsf.), Jerdon, B. of Ind. iii. p. 863 (1864); Holdsw. P. Z. S. 1872, p. 483.

Graculus melanognathus (Brandt), Hume, Nests and Eggs, iii. p. 660 (1875).

Phalacrocorax pygmæus (Pall.), Dresser, B. of Eur. pts. 51, 52 (1876); Hume, Str. Feath. 1878 (B. of Tenass.), p. 496, et 1879, p. 116 (List B. of Ind.).

See krai, Dutch in Ceylon; *Graya de Mare*, Portuguese in Ceylon; *Pankowa*, Hind.; *Niru-kaki*, Telugu; *Pechuck*, Java (Horsf.); *Fesichah*, Arabic; *Kadal Cagam*, Tamil, lit. "Sea-Crow" (Layard), also *Nir kakum*.

Diya kawa, Sinhalese.

Adult male and female. (Ceylon) Length 20·0 to 21·0 inches; wing 7·2 to 7·75; tail 5·0 to 6·0; tarsus 1·2 to 1·3; outer toe 2·2, claw (straight) 0·28; hind toe 0·9; bill to gape (straight) 2·1 to 2·2. India (B. Mus.) Wing 7·8 to 8·1; tail 5·7 to 6·5; tarsus 1·29; outer toe and claw 2·3; bill to gape (straight) 2·2.

This species has 12 tail-feathers.

Iris greenish brown, varying to greenish white; bill fleshy, upper mandible dark brown; facial and gular skin dark.

Breeding-plumage? (Algiers: B. Mus.). Forehead, lores round the eye, gape, and chin black; head, back and sides of neck, and upper part of throat light earth-brown, darker on the ear-coverts; rest of plumage deep black, glossed with green; scapulars, wing-coverts, tertials, and outer webs of secondaries grey, the margins of the feathers and the shafts black; tail greyish black; on the under surface and flanks, neck, and back are numerous fine white plumelets, consisting of a fine shaft and white triangular webbed tip; these overlay, as it were, the plumage, and are quite independent of it; there are fine plumelets also on the wing-coverts.

The dimensions of this example are—wing 8·0 inches, tail 6·0, bill to gape 2·0, outer toe 2·3, tarsus 1·2. The shafts of the clothing-feathers are stiff, giving the plumage a spinous character. I have never met with a specimen in Ceylon in this dress: at the same time, I must admit, I did not shoot any *prior* to the breeding-season, when this plumage, if it is characteristic of breeding, would have been worn.

There is a specimen in the British Museum from India, which is glossy black, with the feathers spinous, as in the above; the throat is whitish, changing by a moult into black, and some tiny white plumelets are appearing on the back, so that the bird appears to be passing into the striated stage. Whether this plumage is changed *during* the nesting-time, or whether this species breeds sometimes in a different livery, showing signs of immaturity, I do not know; but the following is a description of a specimen shot at Uduwila at the nest:—Above black, glossed with green on the back, and slightly inclining to brown on the head and upper part of hind neck; the feathers of the head margined with earthy brown; lores whitish; a small whitish patch over the ears, a white streak at the gape; chin white; feathers of the shoulders and interscapular region edged like the head; the scapulars and wing-coverts tinged with silvery grey with a black border, and the extreme margin earthy grey; quills tipped with the same; the outer webs of the secondaries tinged with silvery grey; under surface brownish black, the feathers indistinctly paling into earthy brown on the chest and fore neck; under tail-coverts and under wing greenish black.

This bird is probably immature; but this may be, notwithstanding, the normal non-breeding plumage of the species put on while at the nest.

Nestling in down. Iris grey; bill blackish, the skin of the forehead and the tip of the lower mandible whitish, covered with blackish down. The clothing-feathers, when they appear, are blackish brown.

Immature in first year. Iris hazel-brown, with a white outer circle; upper mandible and pouch brown; the lower mandible and the margin of the upper from the gape to the tip whitish; legs and feet black.

Chin and gorge whitish for nearly 1 inch from the base of the bill; head and neck pale earthy brown, the centres of the feathers being blackish brown and the margins ochreous grey; feathers blackish on the forehead; shoulders and interscapular region black-brown, conspicuously margined with fulvous grey; scapulars, wing-coverts, and secondaries pervaded with dull silvery grey, with a dark pale-margined border; back and rump black, the feathers indistinctly pale-tipped on the rump; tail tipped with earthy brown; neck and chest ochreous brown, tipped with fulvous grey, passing on the flanks and abdomen into greyish.

Distribution.—This species is very abundant in Ceylon, and is widely distributed, for though it is chiefly confined to the tank-districts in the northern, eastern, and south-eastern parts of the island, it is also found in brackish waters in the western province and southern provinces. In the latter region it is often met with in the non-breeding season on the Amblangoda, Bolgodde, and other lakes, and even visits the Kotte lake occasionally. It is plentiful in the Kurunegala district, breeding at Nikaweratiya tank, where it is, as at many other extensive sheets of water further north, a permanent resident. In July I met with enormous numbers at Minery Lake, and have seen large flocks on Kanthelai tank at the same time of the year. It is plentiful at Rugam, Devilane, Ambaré, and Irrukkamam tanks, and in the Hambantota district affects Tissa Maha Rama and other extensive waters. Except when on passage up the eastern coast to its breeding-haunts, I have never seen it affecting the sea-shore like the larger Cormorant.

In India it is very abundant, frequenting inland waters all over the country. In the Deccan Messrs. Davidson and Wenden say that it is very common, and Dr. Fairbank noticed it along rivers there. Mr. Ball records it from Lohardugga, Singhbhum, Sambulpur, Orissa, Nowagarh, and Karial, and elsewhere remarks that it is very common all over Chota Nagpur. It is also found in the adjoining state of Raipur. Mr. Hume informs us that it sold abundantly in the Calcutta bazaar as "Black Duck!" so that it must be plentiful in the neighbourhood. In Furreedpore and in Cachar it is likewise very common, extending eastwards into Arrakan, Upper Pegu, and Burmah, and breeding in "incredible numbers," according to Mr. Oates, at the Myitkyo swamp in the latter country. In Tenasserim it is plentiful throughout the province; and although it is not yet recorded from the Malay peninsula, it no doubt inhabits that region, as it is found further south in certain islands of the archipelago, among which Java may be cited, where Horsfield procured it and described it as *Carbo javanicus*. I do not find it recorded from the Philippines, nor is it included in either Mr. David's or Mr. Swinhoe's Chinese avifauna; so that it does not appear to have an easterly range beyond Burmah. It likewise is omitted from Prjevalsky's Mongolian birds.

Returning to India, it does not appear to occur in Nepal, but ranges westward as an inhabitant of the low lands to Rajpootana, Sindh, and the surrounding regions. It is uncommon at the Salt Lake at Sambhur; but in Sindh Mr. Hume met with it in the interior in vast flocks; and I find Captain Butler speaking of it as not uncommon in Guzerat, though it rarely occurs at Mt. Aboo. Passing north, Severtzoff speaks of it as breeding rarely in the north-west of Turkestan; but it does not appear to range into the uplands of Kashgharia. It extends through Persia into Palestine, where Canon Tristram observed it on the Leontes and other streams flowing into the Mediterranean. It has been met with not uncommonly in Asia Minor; and, as regards Turkey, is said by Messrs. Elwes and Buckley to be common in Macedonia, being also found on the Danube, where it breeds in large colonies in the willow- and poplar-covered islands. It ranges eastwards to Dalmatia, occurring also in Italy, and rarely visiting Sardinia. It has not been observed in Spain; and, in fact, belongs only as a resident to South-eastern Europe, ranging into Hungary, Transylvania (where it appears in large flocks), and Southern Russia, as far north as the Caspian. It is more common in Germany than in Italy, but does not extend as far north as the Baltic. Lord Lilford writes that it is very abundant in winter in the Epirus.

On the continent of Africa it occurs in Egypt in the Fayoom, where Captain Shelley found it not uncommon on the great lake of Birket el Korn. Von Heuglin also states that it is common as a winter visitor on the lagoons of Lower Egypt; but he never encountered it on the Nile.

Habits.—The Little Cormorant, as will have been noticed in my outline of its distribution, is almost exclusively an inhabitant of fresh water, whereas its larger relative, as we have observed, levies heavy contributions alike on the finny tribes of both salt and fresh water. The present species is not, according to my experience, a very shy bird; for when sunning itself with outstretched wings on rocks or partially submerged fallen trees, I have often approached within shot of it, and might have procured many specimens had I been able to retrieve them from the crocodile-infested waters. This species affects open sheets of water, and also smaller tanks which are only overgrown at the edges, fishing singly or in small parties; it flies swiftly, and when going off to its roosting-places at dusk it proceeds in a long wavy line, which is fed from the flocks on the water, the birds rising one by one as soon as they see that a movement has been commenced by their companions. When fired at they often dive, but sometimes get on the wing and circle round the tank, alighting in a place of safety. Like the Large Cormorant, they flap along the surface of the water when first rising, proceeding some little distance before they are able to mount into the air. The Little Cormorant is very destructive in its way to fish; but is obliged to confine itself to small fry, although it occasionally disposes of good-sized prey; it feeds largely on shrimps. In the month of November I observed, on two occasions, large flocks of this bird coming from the direction of Foul Point towards the Fort. On arriving in Dutch Bay they alighted in a mass, and crowded so close together, that at least fifty birds occupied no more than about three square yards. After remaining some little time diving and swimming quickly about, they took wing for the north, going, as I afterwards found, to the Kodiyam kulam and other tanks to breed. It is, like its congeners, a silent bird; but when nesting makes a craking note.

Nidification.—The breeding-time of this Cormorant is the same as that of the Herons and Egrets, in whose company it nests. In March I found the young nearly all hatched; and in the Hambantota district, and near Trincomalie, most birds had eggs at the time of a visit I made to a large breeding-place in January. Large numbers nest together, building fifteen to twenty nests sometimes in one tree; at Uduwila I found the Darter and the Glossy Ibis nesting in the same trees, and at Kodiyam kulam, near Trincomalie, the Little Egret. The nests were placed mostly on the outer lateral branches, and were small platforms of sticks resting on horizontal forks; the egg-cavity, which is very slight, is lined with fine twigs, and the eggs varied from two to four in number. The exterior surface is chalky white, smooth in places, rather rough in others; beneath the outer coating the shell is pale greenish blue. They are nearly uniform ovals in shape, some more compressed at the small end than others; several specimens measure 1·81 by 1·08, 1·83 by 1·19, 1·75 by 1·17, and 1·85 by 1·06 inch, the latter specimen being a peculiarly long and narrow egg. The old birds I found very tame, alighting on trees close to those containing their nests, and twisting their necks awkwardly from side to side, to see what was going to happen to their charge. The young, when partly fledged, perched in small branches adjacent to their nests, and huddled together, three or four in a row.

In India they nest, says Mr. Hume, in companies of from five or six to fifty or more pairs, and often take possession of nests built by Crows or "Paddy-birds." His measurements of the eggs are—length 1·65 to 1·92, breadth 1·08 to 1·25 inch.

Genus PLOTUS.

Bill slender, straight, very acute at the tip; the commissure slightly recurved; gonys pronounced and ascending; nostrils very minute, basal and linear. Wings pointed, the 3rd quill the longest, the 1st shorter than the 4th. Tail long, of 12 rigid feathers, the webs corrugated. Tarsus shorter than in *Phalacrocorax*.

Neck very slender, with a bend in the vertebræ, similar to that of the Heron. Scapulars elongated.

PLOTUS MELANOGASTER.

(THE DARTER.)

Anhinga melanogaster, Forst. Ind. Zool. p. 22, pl. 12 (1781).

Plotus melanogaster, Gm. ed. Syst. Nat. i. p. 580 (1788); Sykes, Cat., P. Z. S. 1832, p. 171; Jerdon, Cat., Madr. Journ. 1840, xii. p. 222; Blyth, Cat. B. Mus. A. S. B. p. 299 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271; Jerdon, B. of Ind. iii. p. 365 (1864); Holdsw. P. Z. S. 1872, p. 483; Salvadori, Uccelli di Born. p. 367 (1874); Legge, Ibis, 1875, p. 409; Hume, Nests and Eggs, iii. p. 661 (1875); id. Str. Feath. 1878 (B. of Tenass.), p. 496, et 1879 (List B. of Ind.), p. 116.

Der schwarzbäuchige Anhinga, Forster; *Black-bellied Darter*, Lath.; *Snake-bird*, *Silver-laced Snake-bird*, popularly in India. *Banwa*, Hind.; *Goyar* in Bengal; *Kallaki-pitta*, Telugu; *Dandang Ayer*, Sumatra; *Pambuttara*, Ceylonese Tamils.

Diya kawa, *Belli kawa*, Sinhalese.

Adult male and female (Ceylon). Length 36·0 to 36·5 inches; wing 13·0 to 13·6; tail 10·25 to 10·5; tarsus 1·3 to 1·5; outer toe 2·8; inner toe 1·7; hind toe 1·0; bill to gape 3·85 to 3·92, at front 3·2.—*Male* (Sambhur Lake). Length 37·1 inches; wing 14·1, expanse 47·2; tail 10·5; tarsus 1·7; bill at front 3·9 (*Adam*).

Iris pearly white, with an inner and outer ring of yellow; bill with the upper mandible brownish olive, paling into horny grey at the tip; under mandible yellow, changing into greenish grey at the base; legs and toes bluish; inside of tarsus and webs yellowish; toes dusky at the tips.

Adult male. Head and hind neck blackish brown, each feather with a distinct pale buff margin, increasing in width at the sides of the lower part of the hind neck; interscapular region, back, and upper tail-coverts glossy green-black; shoulders, just above the scapulars, with white spots, which lengthen out on the long lanceolate upper scapular-feathers into silvery white streaks, the shafts being, however, black; the lower scapulars are broad, with the stripe on one side only of the shaft; wings and tail green-black, the wing-coverts with broad, pointed, white centres, lengthening on the greater series into very broad stripes; the outer webs of the tail-feathers, as also those of the broader scapulars, singularly corrugated; points of the wing white; a fine white line from the forehead bordering the loral skin and extending to the eye; face, throat, and upper part of fore neck white, passing in a stripe from the face down the sides of the neck for about 6 inches; centre of the fore neck paler than the sides, the centre of the feathers being brownish, but the margins broader and whiter than on the latter; on the upper part these feathers gradually blend into the white of the throat, and on the lower become whitish, forming a pale central streak; entire under surface, flanks, and sides of the neck just above the chest intense black, extending up the fore neck in a point; under wing black.

Adult female (Trincomalie, January). Very similar to the male, but with the pale margins of the head- and neck-

feathers more fulvous, and at the sides of the hind neck there is a broad tawny yellow border next the black of the chest, extending up to the pale stripe on the centre of the fore neck; the stripes of the scapulars, those of the wing-coverts, and the spots of the shoulders are pale golden instead of white.

Young. The nestling is covered with white down, and the first plumage is acquired as follows, my observations being based upon a pair which I took from the nest and reared:—The black scapular feathers, quills, and tail-feathers are acquired first; the quills grow rapidly, then the greater wing-coverts, which are silvery whitish; blackish down-like feathers then appear on the rump and on the shoulders, and then a line of dark feathers down the centre of the breast, which gradually extend to the flanks (during this time the head and neck remain in the white down); shortly afterwards feathers with fulvous edgings appear at the sides of the shoulders and at the point of the wing; then the hind neck commences to clothe from the shoulders upwards, and then the forehead and front of the crown, which are bare and bluish green, commence to clothe with white down. The under surface becomes quickly feathered, eight or nine days only elapsing from the time the black stripe appears until the entire breast and belly are clothed in black feathers with fulvous tips. The iris at this stage is greyish olive and the bill dusky fleshy; legs and feet bluish. The time taken for the whole body to become feathered was from the 12th of February to the 10th of March, at which latter date, however, the neck was still in white down, giving the bird a handsome appearance.

In the first year. Iris yellowish grey; bill brownish green; tarsus and toes exteriorly brown, interiorly yellowish.

A male before me has the crown and down the centre of the hind neck blackish brown, the sides of the neck dark tawny, paling in front, the centres of the feathers dark; chin and throat whitish, the feathers extending in a line along the lower part of the loral skin, which in the adult is entirely bare; face tawny, with an indication of the whitish stripe; under surface and lower part of the fore neck black, with pale tips to the feathers, the tawny yellow bordering next to the shoulders broad and blending into the blackish of the back of the neck; the upper scapulars are short but narrow, and have the white stripes, as have also the wing-coverts; the margins of both are, however, fulvous; the corrugations of the tail and scapulars are almost obsolete.

The full plumage is not acquired until after the second moult.

Obs. The Australian Darter (*P. novæ-hollandiæ*, Gould) is allied to the present species. The lower part of the throat is rufous, and there is an arrow-shaped white gorget, beneath which the neck is brown, the stripe on the side being much broader than in the Indian bird. The light colour of the neck is divided off from the black under surface by a pale border in the same way. A specimen in the British Museum measures as follows—wing 13·5 inches, tail 9·5, tarsus 1·65. In Africa is a third species, *P. levaillanti*, Temm., of similar size to the two already noticed—wing 12·1 to 13·18 (*Heuglin*), 13·5 (*Layard*). It has the sides of the neck striped with black; scapulars striped with fulvous. A fourth species is the American Darter (*P. anhinga*, Linn.), specimens of which were brought to the Zoological Gardens in London some years ago.

Distribution.—The Darter is a common bird in the hot jungle-clad districts of the island, frequenting the vicinity of tanks from the extreme north down to the neighbourhood of Kurunegala on the west, and round the east coast as far as Hambantota and the Girawa Pattuwa. I have met with it at all large tanks and many small village ones throughout the northern forests, and found it breeding in the neighbourhood of Trincomalie not far from the sea. It inhabits the Bintenne Lake, and perhaps other sheets of water near the base of the hills. It is common in the Hambantota district; but I do not know that it extends westwards much beyond Tangalla, except as a straggler, for there, as also in the Western Province, where I have never seen it, the country is unsuited to its habits. It has, however, been occasionally procured at Kotte lake. It reappears north of the Maha-oya, and breeds at the Nikaweratiya tank. Mr. Holdsworth met with it at Aripu, and I believe it is found at the head of the Jaffna lagoon.

It is found throughout India, being, according to Jerdon, exceedingly numerous in some parts of the country, especially in Bengal, where hundreds are often to be seen on a single jheel. As regards its presence at tanks in the Carnatic, I find no special mention; but in the Deccan Messrs. Davidson and Wenden say that it is sparingly distributed. It is found throughout Chota Nagpur, from all districts of which Mr. Ball records it, as also from the eastern parts of the Central Provinces southwards to the Godaveri river. Turning westwards I find Mr. Hume noting it as occurring on the inland lakes of Sindh; and Mr. Doig records it as breeding on the Eastern Narra. It is common in Guzerat, Cutch, and Kattiawar, and in February Mr. Hume

met with it in numbers on the Kunkrowlee lake in Oodeypore. At the Sambhur Lake it has once been shot by Mr. Adam. From the plain-country of Bengal it extends into the valley of Nepal, where Dr. Scully found it fairly common on a lake near Bichiakoh in December. In Furreedpore Mr. Cripps says it is common. Further east, in Upper Pegu, Mr. Oates testifies to the same fact, and at the Myitkyo swamp in Burmah he found it so numerous that he observed two hundred nests in one locality; in Tenasserim it is plentiful both inland and near the coasts. In the Malay peninsula it doubtless occurs, though I find no record as yet of its having been procured there. In the archipelago it has been found in Sumatra, Java, Borneo, and Celebes, from which islands it is recorded by Salvadori in his 'Uccelli di Borneo.' Recently also I observe that Herr Meyer procured it on the river Tumumpat near Menado. Whether it extends to the island of New Guinea or not I am unable to say; but on the south coast the Australian species is found, and may perhaps replace our bird entirely in Papua. From Borneo it finds its way by the Sooloo archipelago to the Philippine group, where it has been obtained in the islands of Mindanao and Negros.

Habits.—This handsome Diver entirely resembles its near relatives the Cormorants in its economy, being entirely a fish-feeder. It is, however, a more expert diver, its slender form and long, snake-like neck being entirely adapted for rapid entry into and progress under the water. From its position on a stake or log near the surface it disappears like an arrow beneath the water; and when swimming is equally expert, for, if alarmed, it sinks its body, and nothing is seen but its long neck, and sometimes only the head, which it darts down out of sight as quick as thought, leaving scarcely a ripple on the surface. I know of no quicker diver, not even the Grebe, than this bird. In Ceylon, as also, from published accounts, in India, the Darter frequents wild unfrequented tanks and jheels, preferring smaller and partly overgrown sheets of water to the larger lakes, like Kanthelai and Minery; but nevertheless in these localities a good many may be seen during the non-breeding time. It is very shy and wary, usually perching on submerged logs and trees well out of shot; here it sits with extended wings and outstretched neck, twisting its snake-like head from side to side to assist its visual powers on the approach of danger, and rarely allows the sportsman to approach within range. It is very swift on the wing, flying with rapid regular strokes, and has a habit in the breeding-season of mounting to a vast height in the air until it looks like a mere speck against the blue sky. It sometimes soars, making one or two circlings with outstretched pinions, and then continuing its course with slow beats.

The neck and gape are capable of great expansion, and it is surprising what large morsels one of these Darters can dispose of. The angular bend in this bird's neck, formed by an alteration in the direction of two or three of the cervical vertebræ, which are set at right angles to those above and below, is the normal position; for the neck is always held thus both sitting and flying, and is never stretched out, except when diving, or when, in confinement, the bird is eager to receive its food. The use of this bend is to impart a powerful leverage in "chucking" the head when jerking its food down the throat, for the bend or short arm gives power to the longer, at the end of which is the bird's head. This is apparent if the lower portion of the neck be grasped in the hand while the bird is chucking its head forward. A pair which I kept in confinement when quite young stretched up their necks to be fed with a tremulous motion of their heads and a combined expansive movement of their pouches, their mouths being held wide open; at the same time they gave vent to a tremulous cackling note mingled with a *chick, chick* sound; now and then, when walking about, they uttered a whistle like *quē-āk*. After a while the youngest died, and the other became very tame, wandering about the outhouses, and often taking up its quarters in the kitchen, where it knew there was food to be had. It was most voracious, attempting to swallow every thing that came in its way, and one day succeeded in bolting a good-sized beef-rib, which would have killed it had I not observed the occurrence and made it disgorge the bone by seizing the lower part of the neck. Before it had acquired its feathers it used to perch upon the edge of its box and extend its pinions, after the manner of its species; the older it became the more it practised this habit, more particularly in the mornings, and at the same time (after it had acquired its plumage) erected the whole of the back-feathers at right angles to its body, raising the wing-covert feathers to an angle of about 70°; the lesser series, however, were held almost as erect as the back-feathers.

The note of the adult is a harsh disyllabic crake, very like the sound emitted by the young.

Nidification.—I found this bird breeding at Uduwila tank in March 1872; and in April of the following

year the Government Agent of the district, Mr. Thomas Steele, C.C.S., kindly sent a man to the same spot to procure eggs for me. He found the entire colony of nests built by the Herons, Ibises, Pelicans, &c. removed, the tank being tenanted solely by a few Darters, who were breeding. In February 1875, at a colony of Egrets, Herons, and Cormorants in the north, I discovered about a dozen pairs of Darters breeding. Their nests, as at Uduwila, were apart from the rest, being placed in trees which grew in the most inaccessible part of the tank. They were built on the tops of the trees, and were rather scanty platforms of small sticks lined with roots. In size the nests were not much larger than those of the Small Cormorant, and not more than three were in the same tree. The females sat closely, with the head drawn in, and did not leave their nests till I had waded close up to the trees; they then flew to the tops of adjacent trees, and returned as soon as I quitted the spot. I observed that, when perched, they frequently scratched their heads, lowering them to a horizontal position, and sometimes below the level of the body; the claws were applied and rapidly moved, as in the case of an ordinary perching-bird. The number of eggs was usually three in a nest; but in some there were four. They are normally elongated ovals, slightly smaller at one end than the other; but they vary in shape, some being much broader than others. The external texture is rough and chalky; but beneath this exterior, which is dull white, and which is easily removed and is often partially worn off by the bird's feet, is a smooth light green shell. They vary from 2·0 to 2·15 inches in length, and from 1·2 to 1·38 in breadth.

Mr. Hume's measurements of the eggs are—length 1·95 to 2·29 inches, breadth 1·28 to 1·46. In India, where the bird is, in some localities, very abundant, it breeds in large colonies. Mr. Oates speaks of one in which there were about two hundred nests.

Genus PELECANUS.

Bill immensely long, flattened, the tip furnished with a powerful nail; culmen flat, bounded on each side by a narrow groove, at the base of which the minute nostrils are situated; under mandible divided by a membrane or pouch, which extends to the tip, the base much broader than that of the upper, which is compressed beneath the nostrils. Wings ample and very long, the ulna being much lengthened; 3rd and 4th quills the longest; tertials exceeding the primaries. Tail of 16 feathers, rounded at the tip. Tarsus short, much compressed, reticulate in front; tibia almost completely feathered. Toes long, the outer slightly less than the inner; all four joined by a full web.

Of large size. Sternum with only a slight emargination in the posterior edge, the furcula completely joined to the keel.

PELECANUS PHILIPPINENSIS.

(THE GREY PELICAN.)

Pelecanus philippinensis, Gm. Syst. Nat. i. p. 571 (1878); Walden, Trans. Zool. Soc. 1875, ix. p. 246.

Pelecanus philippensis (Gm.), Blyth, Cat. B. Mus. A. S. B. p. 297 (1849); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271; Jerdon, B. of Ind. iii. p. 858 (1864); Holdsw. P. Z. S. 1872, p. 482; Hume, Nests and Eggs, iii. p. 658 (1875); David & Oust. Ois. de la Chine, p. 531 (1877); Hume, Str. Feath. 1878, p. 495 (B. of Tenass.); Oates, ibid. 1878, vii. p. 41; Hume, ibid. 1879, p. 116 (List B. of Ind.).

Pelecanus rufescens (Gm.), Elliot, P. Z. S. 1869, p. 583 (in part).

Pélican des Philippines, Buff. Pl. Enl. 965; *Pelican*, Europeans in Ceylon. *Won-bo*, Arrakan (Blyth); *Walang kadda*, Java; *Koolookedai*, Ceylonese Tamils (Layard).

Kula-kidar, Sinhalese.

Adult female (March, Ceylon). Length 52·0 inches; wing 20·5; tail 8·5; tarsus 3·0; middle toe and claw 4·6; outer toe and claw 4·2; bill at front (not including the nail) 11·0, gape to tip of nail (straight) 12·3, width of upper mandible at the base 1·2, of lower at gape 2·2.

Feathers of forehead forming a concave line at the base of the bill.

Iris brown; bill fleshy, with bluish spots and oblique bars on either side of the culmen; pouch and facial skin fleshy, marked with dark veins and patches; legs and feet bluish; webs darker than the toes.

Feathers of the head and neck white with dark bases, of a fluffy character, and standing erect from the skin; a short nuchal crest an inch long and slightly recurved; interscapulary region, upper scapulars, wing-coverts, and under surface white; the wing-coverts lanceolate in shape, and the longer scapulars and greater coverts with black shafts; the back, flanks, and axillaries delicate vinaceous, the shafts darker than the webs on the back; abdominal region and under tail-coverts tinged with vinaceous; underlying broad scapulars, tertials, greater secondary wing-coverts, secondaries, and tail grey-brown, the feathers white at the base, those of the tail paling to whitish at the margins; primaries and their coverts dark brown, white at the base; upper tail-coverts white, with dark shafts; under wing white, the lesser series of feathers rosy grey or vinaceous; under tertial coverts white.

This specimen was shot from the nest, and is much soiled on the under surface; the fluffy feathers end on the fore neck about 5 inches from the pouch, up to which point the normal smooth feathers of the under surface reach.

The rosy tint is, I imagine, variable, being much more conspicuous in some specimens than in others, and in the non-breeding season is absent.

Young. The nestling is at first covered with white down.

In first plumage the upper back and under surface, as also the neck, are brownish grey; lower back and upper tail-coverts whitish; wing-coverts brown; quills and tail dark brown.

Bill fleshy, the spots less plainly indicated than in the adult; legs and feet bluish.

Obs. The Grey Pelican of India, to which Gmelin's name appears applicable, has been considered by some to be the same as the African species, *P. rufescens*, Gm. Among those who have united the two birds are Schlegel, Elliot, and G. R. Gray; while other high authorities, Mr. Sclater, the Marquis of Tweeddale, and Mr. Hume, hold that the Indian bird is distinct. I have examined the specimens of the latter bird in the British Museum and find that the feathers of the head and neck are quite different, not partaking of that fluffy or furry nature which is eminently characteristic of our bird; the crest is altogether different, and the bill has none of the peculiar "impressed" spots, which are also a well-marked feature of *P. philippinensis*; it (the African species) is also larger and has a longer bill than our bird. An adult specimen measures—wing 22·0 inches, bill (gape to base of nail) 12·2; an immature example—wing 20·5, bill (gape to base of nail) 11·3. There appears, therefore, to be no question as to the distinctness of the two species. Assuming that the Philippine bird is the same as the Indian, this species was first described from Luzon from an example sent to Paris.

Pelecanus javanicus, Horsf., the Lesser White Pelican of India, is white tinged with rosy; the tail is white also, and the primaries dusky grey. It is considerably larger than the Grey Pelican. Fifteen specimens tabulated by Mr. Hume measure in the wing from 23·0 to 26·75 inches; tarsus 4·25 to 5·5.

Distribution.—This Pelican is found throughout the northern half of Ceylon both on brackish lagoons near the coast and large tanks situated in the interior; its habitat extends down the east side of the island to the Hambantota district; but westward of Tangalla I never saw it, not even on any of the large salt lakes such as Amblangoda, Bolgodde, Pantura, and Negombo. It is not met with on village tanks; and though immense flocks may occasionally be seen on the larger sheets of water (Kanthelai, Minery, Padawiya, Rugam, Ambaré, Tissa Maha Rama, &c.), yet the Pelican is much more frequently seen on those estuaries, lagoons, and leways where the water is shallow and an abundance of fish is available for its sustenance.

In India it is the most abundant species of Pelican, according to Jerdon; but though it is so numerous and so widely spread it apparently retires principally eastward of Bengal to breed. Jerdon speaks of one Pelicanry in the Carnatic which he visited, and mentions the existence of many others. Mr. Hume, however, making more recent investigations, was unable to find the localities where any of these colonies existed, and is of opinion that Pelicans do not breed, as a rule, in the Peninsula. It must not be forgotten here that these birds, as well as other species (Herons, Ibises, &c.) which congregate together, occasionally remove the entire collection of nests to other parts so completely that not a vestige of them exists in the following season. In the Deccan the Grey Pelican is evidently rare; Mr. Davidson mentions the occurrence of a single specimen at Pundharpur in September. From Chota Nagpur it is not recorded at all, and in the north-western region (Sindh, Guzerat, Cutch, Kattiawar, and Rajpootana) it is only a cold-weather visitant, though notwithstanding very numerous in certain localities, where it is met with in enormous flocks. In Rajpootana, however, it is only a straggler. In Eastern Bengal it does not appear to be very numerous. I observe that Mr. Cripps only observed it in the month of April in Furreedpore; in other portions of the province, however, it probably musters in greater force, for Blyth in 1849 stated it to be commoner in Lower Bengal than *P. javanicus*. In Pegu it was observed at Thayetmyo by Captain Feilden; and in the Shwaygheen district it breeds in enormous numbers, as will be presently noticed. In the northern parts of Tenasserim it is numerous in the breeding-season, especially in the neighbourhood of Thatone and Khyketo. In the Malay peninsula it is recorded from Malacca by Salvadori; and as an inhabitant of Borneo it is doubtfully noted by Salvadori. In the island of Java it has also been noticed; but I see no mention of its occurrence in Sumatra. It has been obtained in the Philippines at Luzon, and is doubtless found in other islands of the group. Returning to the mainland I find Swinhoe recording it from Amoy, and Père David stating that it is very common on the great rivers of the empire, as well as on the coasts. He observed it at Pekin, and likewise met with it in the interior in Mongolia. It also occurs in Cochin China.

Habits.—As above remarked, the favourite haunts of the Pelican in Ceylon are the brackish salt lagoons and "leways" lining the eastern coast of the island. Here they meet with an abundance of food, and levy tremendous contributions on the finny tribes! It is their practice to form a line across a shallow piece of water, each bird a few feet apart from its neighbour, and then advance with their heads under water, seizing their prey right and left until the opposite side is reached and the whole lagoon is almost cleared of fish. It passes most of its time in the water, seldom approaching the banks, except to plume itself, and this it does mostly while floating lazily about. When thus situated it has rather a graceful appearance, its neck is curved backwards and its long bill carried down almost resting on the front of the neck; and when two or three are together they generally swim in single file or one a little behind the others in "échelon." The Pelican rises with considerable exertion, flapping along the surface of the water and mounting gradually in the air until it has reached some height, when it proceeds along with very slow flaps of its immense wings, the head and neck drawn in, and, if there be a small flock, the whole proceeding in a line, one bird, as a leader, somewhat in advance of the rest. Long before they alight, having gained great momentum from their heavy weight and powerful wings, they descend with outstretched and motionless wings, literally sailing down to the water, when they drop their legs, and, carried forward by the impetus of their descent, plough up the surface for several yards.

An enormous "mob" of Pelicans suddenly alarmed and put on the wing presents the finest spectacle that can be witnessed of bird-life. There is nothing to equal it in the world. I have seen very large flocks of the splendid Australian Pelican (*P. conspicillatus*), but never saw any thing to equal the vast assembly that I encountered one morning in July 1875 on Kanthelai tank. The weather had been very dry, and the whole of

the Pelicans in that part of Ceylon seemed to have collected literally in thousands on the tank. My companion took a long shot into the " mob " with a rifle, and the various scattered flocks which were floating calmly about streamed steadily up into the air one after the other, and each commenced to soar majestically round in bold circles which crossed each other, overlapped, sometimes joined in one common circuit, and then rolled off again into separate parties until the whole air was a mass of immense circling birds which rose far into the sky and then wheeled off over the surrounding forest.

The Pelican is an exceedingly silent bird, and does not appear to become, like most birds, demonstrative during the breeding-season even. A pair of young birds which I brought round to Galle from the south-east coast used to make a hoarse guttural croak when they saw their food coming, flapped their wings, and darted out their huge bills with an expansive motion of their pouches. They thrived well until the wet damp weather of the south-west monsoon (a thing unknown in their natural habitat on the other side of the island) came on, when they both died.

Nidification.—The Grey Pelican breeds in company with other birds (Herons, Ibises, and Cormorants), and, doubtless, like them, resorts to the same spot year after year, unless much disturbed, when it will occasionally desert the Pelicanry and carry off its nest to some other secluded spot. One of the longest-known of these interesting places is the Pelicanry at the great tank of Padawiya, concerning which Sir Emerson Tennent has written an interesting account. In the vicinity there are other localities, such as at Sieventhe-murrippu, where Capt. Wade-Dalton informs me he found a very large colony some few years ago; and, again, there is another spot not far from Tirai where these birds usually breed. I have heard of a breeding-place in the Minery district, and there is a large colony near (Rugam) Rukam tank. In 1872 I found about a dozen pairs breeding at the oft-mentioned Uduwila tank, near the Kirinde Ganga. The nesting-time in Ceylon is between December and March, and by the latter month the young are sometimes nearly all hatched out.

While on a visit to Tissa Maha Rama I heard from a native that there was a place near the river, and about five miles distant from Tissa, where great numbers of water-birds bred. Starting one morning at the usual hour for bullock-cart travelling (2 A.M.), I traversed the dense jungle on the east side of the river, and arrived at the crossing-place of the Hambantota road before daybreak. Here a sparkling stream flowing down the gravelly bed of the river, on either side of which was a broad stretch of cool sand, completely canopied by the foliage of the magnificent Koombook-tree, offered a most delightful spot for outspanning; and so leaving the bullock-cart in charge of the driver, I started with my coolies for the tank, about a mile distant. The day was just dawning, and the harsh call of the Buff-breasted Kingfisher, mingled with the trill of the Red Woodpecker and the voluble notes of the Racket-tailed Drongo, were beginning to break into the stillness of the forest. After striking off the rough track we traversed an open space of long rank grass and vegetation, where paddy had been cultivated some years ago in the upper waters of the tank, and approaching a narrow belt of jungle, which we could not see over, we heard the first indications of the vast bird-colony which had taken up its quarters in the depths of the jungle. Listening to the cries of the hundreds of young birds mingled with the " croaks " of Herons and the *quaks* of Egrets, we stepped through the narrow belt of jungle, I may say, on the tiptoe of expectation, and came in view of one of those wonderful scenes which it is almost useless to describe to those who have not explored eastern jungles.

Teeming tropical nature was just awakening from her slumbers, and hundreds and hundreds of the showiest birds which the island of Ceylon produces were assembled together in the small space of a few acres. An area of about fifty acres, surrounded by luxuriant forest, beneath which was a belt of thorny and almost impenetrable jungle, enclosed the half-dried village tank of Uduwila, reduced to a muddy pond of two or three acres by the drought of several months. In this murky pool, polluted by the droppings of hundreds of huge birds, stood about forty or fifty thorny trees, averaging from 20 to 30 feet in height, and round the edge of the water was a broad expanse of black mud fancifully cracked by the sun and pitted all over with numberless elephant-footprints. All these trees were loaded with huge nests and literally covered with magnificent birds. Rows of elegant White Egrets and Spoonbills, graceful Herons and gaunt Shell-eaters, little groups of stately Pelican-Ibises, their rosy plumage glistening in the rays of the sun, just appearing above the surrounding jungle, colonies of swarthy Cormorants and little assemblies of handsome " Snake-

birds" all lined the overladen branches by their nests, or stood like sentinels on the tops of the more distant forest-trees; lastly about a score of huge Pelicans stood on the large platforms of sticks which contained their offspring, and busied themselves preening off the night-dew from their broad backs. But already the numerous assembly had begun to bestir itself, mindful of the labour which those hundreds of hungry mouths entailed during the coming day. Spoonbills and Ibises filed off to distant marshes, Egrets flapped away over the surrounding forest, Cormorants streamed off in rows towards the great tank of Tissa Maha Rama, and several Darters or Snake-birds dashed round and round the tank as if they were training for a race.

It was a sight to have gazed on for hours; but as the sun was fast mounting into the sky and I had come for eggs and specimens, I was obliged to commence work after jotting down in my notebook the different species at their nests so as to identify the eggs. The first shot brought down a splendid Grey Heron which was sailing over my head; and then the scene was instantly transformed, the air swarmed with the assembled multitudes, and the lonely jungle resounded with bird-cries; the Pelicans launched themselves from their nests and, joined in hopeless confusion by Herons, Egrets, Ibises, and Darters, mounted high in the air and soared round and round above their young; but many of each species, more bold than their fellows, dashed about over their nests and furnished me with a few specimens, but only as many as I could carry away, for I never shot a bird I did not want during eight years' hard work collecting in Ceylon. The Shell-eaters, which were the most numerous of all, swooped down on me from vast altitudes as I floundered through the muddy water, regardless of the crocodiles, making a booming sound, and almost touching their nests mounted high again with the impetus gained by their descent. It was no easy matter to ascend the thorny trees slimy and whitened with guana and pervaded with an awful stench. The Pelicans' nests, with which we have now only to do, were very large platforms of moderately sized sticks, the entire structure measuring at least 3 feet across; they were placed on the tops of the largest trees and mostly rested in the forks of crooked and distorted thorn-branches; the top or upper surface was quite flat and lined with good-sized twigs. The companions of the Pelicans were Glossy, Shell-, and Pelican-Ibises and the Little Egret (*Herodias garzetta*). Most of the nests had two or three young ones; but in one or two there were eggs, three being the number of the clutch. They are almost perfect ovals, moderately smooth but chalky in texture, and much smeared with blood and dirt, quite obscuring the original uniform white colour. They varied from 3·0 to 3·2 inches in length by 2·1 to 2·2 in breadth. When I ascended to the nests with young they stood up and stared stupidly at me, but showed no disposition to resist. When seized by the neck they darted out their heads and flapped their wings.

The Pelicanry at Uduwila, which was bodily removed by the birds after my visit, was of course a very small one, these birds being less in number than any other species. Some of those mentioned above are, I understand, tenanted by many hundreds of Pelicans; but even these must be small compared with the vast colony discovered, in November 1877, by Mr. Eugene Oates in the forest near Shwaygheen, and which covers the Pegu plain on the west side of the Sittang river. This vast tract is inundated for five months in the year, forming an immense forest-swamp, just the place of all others to attract Pelicans, and concerning which I transcribe the following passage from Mr. Oates's interesting account:—

"The whole stream from the Sittang to Kadat runs through beautiful forest with spare undergrowth, and in many places the stream narrowed so much that we had carefully to pick a way for the boat between the trees. Immense flocks of Pelicans and Adjutants were flying in circles over our heads the whole day. Monkeys were very common, and I saw more specimens of *Polioaëtus ichthyaëtus* during this trip than I did during the whole of my residence in Burmah.

"We arrived too late in the day to do any thing, but in the afternoon, strolling out, we saw a good many Adjutants' nests; but it was not easy to climb the trees.

"On the morning of the 11th I started early with several Burmans into the forest. The floods had gone down, but the ground was very muddy, and in many places for long distances the water came up to my knees. Every quarter of a mile there was depression or nullah to be crossed, and I soon gave up any idea I might have had of keeping myself dry. Walking was very laborious, for though there was no undergrowth of jungle to speak of, yet roots of trees embedded in mud and water caused me frequently to trip up.

"The whole forest consisted of very large trees, but a portion (about one in twenty) was made up of wood-oil trees, gigantic fellows 150 feet high and more, and with a smooth branchless trunk of 80 to 100 feet high. These are the trees selected by the Pelicans. I was out that day till 3 P.M. continually moving, and

must have walked at least twenty miles in various directions, but never from first to last was I out of sight of either a Pelican's or Adjutant's nest. From what I saw and from what the Burmans told me, I compute the breeding-place of these birds to extend over an area about twelve miles long and five broad.

"I shall describe the Adjutants nests presently; but, with regard to the Pelicans, I noticed that no tree contained less than three nests and seldom more than fifteen. Some birds select the upper branches, placing their nest in a fork; but others, the majority, placed their nests on the nearly horizontal branches of the tree not far from the trunk. In all cases the nests on one branch touch each other, and when these nests were on a horizontal branch they looked like enormous beads.

"Judging from the size of the bird, I should say the nest is about 2 feet in diameter, and, when in a fork, to be about 18 inches deep. Others on flat branches were shallower. They are composed entirely of twigs and small branches; and I could detect no lining in those nests which were thrown down to me.

"The eggs are invariably three in number, and on the 11th of November all I took were either fresh or only slightly incubated. The female bird sits very closely, and frequently I found that the bird would not fly off her eggs till I fired a gun. It was a most ludicrous sight to see the sitting birds stretch neck and head out of the nest to have a look at us, as often happened.

"The only trees which the Burmans can climb on the spur of the moment are those which their arms can encircle. To be able to climb any tree it is necessary to make bamboo spikes the day before. These are driven into the trunk as the man mounts, and the operation, even for the tallest tree, does not take very long.

"Notwithstanding the millions of birds which breed in this forest, a most wonderful silence prevails. The Pelican seems to be perfectly mute, and the Adjutants only bellow at intervals; the only sound which is constantly heard, and after a time even this sound passes unnoticed, is a sort of Æolian harp, caused by the movements of innumerable birds high in the air."

In a large series of eggs taken by Mr. Oates, some are said by him to be so discoloured as to be almost black. The largest measured 3·3 inches by 2·08, and the smallest 2·95 by 2·05.

STEGANOPODES.

Fam. FREGATIDÆ*.

Bill straight and hooked at the tip. Wings very long. Tail long and deeply forked. Tarsus *very* short, feathered. Toes long, only connected at the base by a web.

Plumage illumined with metallic reflections. Chin furnished with a pouch. Sternum with the furcula long and completely joined to the keel; coracoid bones very broad and stout at the base.

* These remarkable birds have all the external appearance of the Raptorial order, to which they likewise assimilate in plumage and somewhat in their mode of living. Notwithstanding, however, their strong affinities with the Accipitres, the internal structure of the Frigate-bird is that of the Pelecanidæ; and this is particularly exemplified in the way the keel of the sternum and the furcula are joined; while also, in the matter of bill and pouch, they resemble the Cormorants. But, in spite of these characters, some learned systematists (and among them the late talented Professor Garrod) have considered the Frigate-birds to form an aberrant section of the Accipitres.

Genus FREGATA.

Bill longer, broader, and more hooked than in *Phalacrocorax*. The culmen flattened, and the lateral grooves pronounced and continued to the tip; margins of both mandibles coinciding; tip of the lower decurved and produced. Wings very long and pointed; the 1st quill considerably exceeding the 2nd. Tail long and deeply forked, of 12 feathers. Tarsus extremely short, not exceeding the hind toe; middle toe lengthened, and the outer longer than the inner; anterior toes connected by a deeply incised web; claws long, curved, and with the inner edge of the middle pectinated.

Of large size; aerial habit. The feathers of the head elongated. Plumage illnmined with metallic reflections.

FREGATA MINOR.

(THE LESSER FRIGATE-BIRD.)

Pelecanus minor, Gm. Syst. Nat. i. p. 572 (1788).

Attagen ariel, G. R. Gray, Gen. B. iii. p. 669 (1845, ex Gould, MS.); Layard, Ann. & Mag. Nat. Hist. 1854, xiv. p. 271.

Attagen minor (Gm.), Holdsw. P. Z. S. 1872, p. 482.

Fregata minor (Gm.), Buller, B. of New Zealand, p. 342 (1873); Salvadori, Uccelli di Borneo, p. 364 (1874); Sclater & Salvin, P. Z. S. 1878, p. 650; Hume, Str. Feath. 1879, p. 116 (List B. of Ind.).

Petite Frégate, Buffon, Hist. Nat.; *Lesser Frigate*, Lath.; *Man-of-War Bird*, sailors; *Frigate Pelican* of some.

Adult (Australia; Brit. Mus.). Wing 20·7 to 21·5 inches; tail 13·0 to 14·5, depth of fork 6·0 to 7·5; tarsus 0·7; middle toe 1·85, claw (straight) 0·75; bill to gape (straight) 3·9; length of culmen, exclusive of hooked tip, 2·8.—*Males* (Raine Island; 'Challenger' coll.). Wing 20·5 to 21·0; tail 13·5; bill to gape (straight) 4·1, width at gape 0·93.—*Female* (Ceylon; Poole coll.). Wing 20·2.

Male. Iris red ("black?" in Admiralty-Island specimen, P. Z. S. 1877, p. 555); bill grey; skin of throat red; eyelid black; legs and feet black.

Female. "Iris red; eyelid, legs, and feet red; skin of throat not so red as in the male." (*J. Murray.*)

Male (N.W. coast of Australia). Plumage black, the feathers of the back long and lanceolate, glossed near the tips with lively green, above which the webs are illumined with an amethystine hue, but not bronzed as in the next species; wing-coverts the same; tertials passing into brown at the tips; beneath brownish black, glossed with green and purplish; on the lower flanks a patch of white.

Female (Raine Island). Head and neck black, the feathers glossed with green; back blackish brown, the feathers pointed as in the male; chest, upper breast, and flanks white, passing round upon the hind neck; lower wing-coverts broadly margined with greyish white; pouch not so large as in the male.

The example in the Poole Collection corresponds with these in all respects.

Obs. All examples (so sexed) of females which I have examined have these white markings on the under surface; but I am of opinion that when old they attain the dark plumage, owing to the light coloration being the immature characteristic.

Young in down (Raine Island). White, the down thick and long; the interscapulary region and scapulars, which are in feather, blackish brown, with pale margins; bill to gape 2·85 inches.

Immature. "Iris black; bill and feet whitish, with a shade of blue." (*J. Murray.*)
Head, neck, and chest whitish, washed with cinnamon-reddish, passing into brownish on the breast; abdomen white; back brownish; wing-coverts brown, margined with greyish.

FREGATA AQUILA.

(THE FRIGATE-BIRD.)

Pelecanus aquilus, Linn. Syst. Nat. i. p. 216 (1766).
Fregata aquila (L.), Illiger, Prodr. p. 279 (1811); Buller, B. of New Zeal. p. 339 (1873); Salvadori, Uccelli di Born. p. 364 (1874); Hume, Str. Feath. 1879, p. 116 (List B. of Ind.).
Attagen aquilus (Linn.), Gould, B. of Austr. vii. pl. 71 (1848); Jerdon, B. of Ind. iii. p. 853 (1864).
Man-of-War Bird; *Frigate Pelican.*

Adult male and female (Mus. Salvin and Godman). Wing 24·5 to 26·5 inches; tail 17·5 to 18·5, depth of fork 10·0 to 11·5; tarsus 0·8; middle toe 2·0 to 2·2, claw (straight) 0·8 to 0·9; bill to gape (straight) 5·3 to 5·7; gular pouch extending to 4½ inches from the edge of the feathers at sides of lower mandible. The smaller measurements relate to females.
Iris red; bill pale bluish, nail flesh-colour; feet fleshy reddish; gular pouch in the male scarlet.

Adult. Above black, the feathers of the head long and attenuated, those of the hind neck and the uppermost scapular of lanceolate shape, the former glossed with green and the latter with metallic bronze and purple; the wing-coverts likewise with green reflections, and the quills glossed; the lower back and upper tail-coverts with brownish-green reflections; beneath brownish black, glossed on the chest and flanks.

Nestling (British Honduras; May). Covered with white down everywhere but on the interscapulary region and scapulars, which are feathered and black, with the tips of the plumes paler; primaries, which are just appearing, black; feet yellowish.

Immature (same locality; May), presumably one year old. Head, nape, throat, chest, and centre of breast white; back and scapulars black, with a slight green reflection, and the edges of the feathers somewhat pale; lesser wing-coverts pale brown, with greyish margins; the median series darker, the greater coverts, primaries, and secondaries glossy black; tail black; flanks and axillaries brown; under wing black-brown; pouch not bare below the gape.

Older bird (May), presumably two years old. Head black, the feathers attenuated and glossed with green; throat and face brown-black; chest and the sides of the breast white, extending almost on to the hind neck; back and scapulars black, more glossy than in the above, and the feathers more lengthened; wing-coverts as in the last.

Obs. In this stage, Mr. Godman informs me, they breed.

Distribution.—I include this species doubtfully in our avifauna, as it is possible that some of the specimens seen from time to time on the west coast of Ceylon may have belonged to it.

It is said occasionally to visit the Bay of Bengal and the Indian Ocean, but rarely strays, writes Sundevall, further north than 10° N. lat. Jerdon includes it in the avifauna of India on the strength of one specimen which was shot on the Malabar coast off Mangalore; but I find no recent record of its occurrence in Indian waters. In the Indian Ocean I have seen what I take to be it between Galle and the Cocos Islands, at which latter locality it is not uncommon. It is found at the Seychelles, Mauritius, Rodriguez, and Madagascar, and to the east occurs throughout the Malay archipelago, being recorded from Sumatra, Java, the Moluccas (Batchian), Halmahera, and New Guinea. In Torres Straits it is not uncommon, occurring all along the north coast of Australia to Cape York, and extending thence eastwards to New Caledonia, Samoa, Society Islands, Palmerston Islands, Marshall Islands, the Phœnix group, and the

Obs. This species, besides being smaller in the wing than *F. aquila*, may be distinguished from it, in the adult male plumage, by the white patch on the flanks.

Distribution.—This fine Frigate-bird is a frequent visitor to the shores of Ceylon, and, as in the case of many other tolerably rare sea-birds, is generally met with on the west coast. Layard, who first recorded it, thus writes (*loc. cit.*) :—" Mr. Brodie, of the Ceylon Civil Service, first shot this species on Calpentyn Lake; and

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Sandwich Islands. It has once been procured, in 1863, on the New-Zealand coasts. Crossing the Pacific we find it frequenting the west coast of Central America from California down to Peru; while on the eastern side of the continent it is found along the coast from Bermuda to Florida, where it breeds, and thence southwards to the coast of Brazil. It is common throughout the West Indies. In the Central Atlantic it inhabits the waters surrounding Ascension Island and St. Helena: at the former place it is numerous, for I saw many examples in the course of a day spent there; and at Boatswain-bird Island it breeds plentifully.

Habits.—The "Frigate Pelican" for the most part frequents the vicinity of land, where numbers of sea-birds are usually to be found fishing, and there successfully plies his robber-trade. Occasionally, however, it is to be seen on the open ocean, and I have myself noticed it two days' steam from the nearest land. At Ascension I had an opportunity of witnessing its marvellous powers of flight in chasing the Boobies and Terns (*Sterna fuliginosa*) which thronged the waters round the island.

It is rather an ungainly bird when perched, if one can judge by the appearance of the rather disconsolate-looking captive now in the Zoological Gardens. This individual bobs his head up and down when approached and utters a harsh scream when spoken to by his keeper. The neck is drawn in, and the hind toe is held in rear of the perch.

Audubon, who wrote a graphic description of the flight and habits of this bird, considered it to be much more swift on the wing than the fastest American Hawks. He remarks that it comes "from on high with the velocity of a meteor, and on nearing the object of its pursuit, which its keen eye has spied while fishing at a distance, darts on either side to cut off all retreat, and with open bill forces it to drop or disgorge the fish which it has just caught. See him now! Yonder, over the waves, leaps the brilliant dolphin, as he pursues the flying-fishes, which he expects to seize the moment they drop into the water. The Frigate-bird, who has marked them, closes his wings, dives towards them, and, now ascending, holds one of the tiny things across his bill. Already fifty yards above the sea, he spies a porpoise in full chase, launches towards the spot, and in passing seizes the mullet that has escaped from its dreaded foe. I observed a Frigate Pelican that had forced a Cayenne Tern, yet in sight, to drop a fish, which the broad-winged warrior had seized as it fell. This fish was rather large for the Tern, and might probably be about 8 inches in length. The Frigate Pelican mounted with it across its bill about a hundred yards, and then tossing it up caught it as it fell, but not in the proper manner. He therefore dropped it, but before it had fallen many yards caught it again. Still it was not in a good position, the weight of the head, it seemed, having prevented the bird from seizing it by that part. A second time the fish was thrown upwards, and now, at last, was received in a convenient manner, and immediately swallowed."

Nidification.—The breeding-time of this species on the coast of America is in April; and it may be concluded that in other tropical situations, either in the Indian or Pacific oceans, its time for nesting will be the same. Mr. Salvin found it breeding in high mangrove-trees on islands in atolls bordering the coast of British Honduras. The nests were made on the tops of the trees, and were frail structures of sticks. The young, which looked like puff-balls of white, were lying helpless in the nests, and the "youngest were guarded," he writes, "by one of the parent birds, which balanced itself on the edge of the nest;" and from the unhatched eggs the birds could hardly be prevailed upon to move. Audubon remarks that when commencing to repair their nests "they break the dry twigs of trees with ease, passing swiftly on wing, and snapping them off by a single grasp of their powerful bill. It is, indeed," he remarks, "a beautiful sight to see them when thus occupied, especially when several are so engaged, passing and repassing with the swiftness of thought over the trees whose tops are blasted; their purpose appears as if accomplished by magic. It sometimes happens that the bird accidentally drops a stick while travelling towards its nest, when, if this should happen over the water, it plunges after it and seizes it with its bill before it has reached the waves."

In shape the eggs of this Frigate-bird are moderately broad or long ovals, the diameter varying somewhat; they are of a chalky texture, but the surface is not rough. The colour is a uniform dull white, with smears of blood occasionally. The measurements of three specimens in the British Museum are—2·69 by 1·79, 2·62 by 1·87, and 2·47 by 1·83 inches.

I subsequently saw two, which were killed from the lighthouse in Colombo in February 1853; one passed into my possession, the other into the museum of the Ceylon Branch of the Royal Asiatic Society. I frequently saw them during the month flying at immense altitudes over the coast." Next in order are the observations of Mr. Holdsworth, who writes that he saw them on many occasions at Aripu during the strength of the south-west monsoon, and they were generally in parties of five or six, at a considerable height above the shore. In June 1877 an immature example was shot at Jaffna by Mr. Smart, of the C.C.S. As regards my own experience, I have seen Frigate-birds, both at Colombo and Galle, during the months of May, June, and July. The three examples I observed were all passing southwards along the coast.

The range of this Frigate-bird is not so extensive as that of its larger congener. From the Indian Ocean, to which it can only be considered a frequent straggler, it extends eastwards through the Malay archipelago to Polynesia and the Australian seas, and ranges as far north as the China coasts, where Swinhoe procured it at Amoy. Salvadori records it from Borneo doubtfully, but notes it from Batchian, the Aru Islands, and the Moluccan seas; and at the Admiralty Islands it was obtained by the 'Challenger' naturalists. It has been procured on the south coast of New Guinea, and in Torres Straits it is a common bird. At Raine Island it was found breeding many years ago by Commander Ince, R.N., and more recently by the naturalists of the 'Challenger.' It is further recorded from Port Darwin, Cape York, and Rockingham Bay. On the north-west coast it is equally well distributed. As regards the Pacific Ocean, it is found at New Caledonia, but is said not to extend into Central Polynesia like the larger species. Southwards it extends to the coasts of New Zealand, where it has once occurred; but it has not been observed in Tasmanian waters.

Habits.—Though far less has been written concerning the habits of this species than of its larger congener, the well-known "Man-of-War" Bird of the Atlantic, whose powers of flight were, years ago, so well described by that graphic writer Audubon, yet it possesses the same power of wing and marvellous speed when chasing its prey. No oceanic species has such an expanse of wing, in proportion to the small size and light weight of its body, as the Frigate-bird; not even the Albatross, justly renowned for its length of wing and majestic flight, can boast of so much power in relation to the work to be done, for although its bones are peculiarly light, yet its frame is massive and heavy compared with the aerial form of the Man-of-War Bird. A glance at the living bird or at the freshly killed specimen immediately displays these peculiarities; the immense quills and great length of the ulna- and humerus-bones conduce to form an ample wing which completely hides the almost diminutive frame which has to be propelled. It is no wonder, therefore, that the Frigate-bird sails along against the wind perfectly motionless, as if propelled by some invisible power, or that, in robbing the Gannet or Tern of their prey, a few powerful strokes of its great pinions impart such a momentum that it is enabled to rush like a rocket upon the frightened sea-birds, and catching the fish as it falls from their bills, to rise again on its course as easily as it descended.

The Frigate-bird takes its food entirely on the wing, either pursuing flying-fish, on which it subsists largely, swooping on other sorts which happen to show themselves near the surface, sweeping down on crabs and cuttle-fish, or pursuing Gannets, Terns, and Gulls and catching the food which they drop from their bills before it reaches the water. Commander Ince, in writing to Mr. Gould, remarks that he found in the females of those shot at Raine Island "young turtles, fish, cuttle-fish, and small crabs." I have seen these birds soar round in short circles over a shoal of fish, now and then remaining suspended for a second or two over some particular spot. At this time the wings were kept extended after the manner of a Kestrel's, when it ceases for a moment to ply its pinions. At Galle and Colombo, where I observed the birds spoken of, they were sailing along with their wings quite motionless, and were progressing slowly along against a moderate breeze without any apparent exertion, the secret of which is to be found in the great impetus given to the bird's frame by a few powerful strokes of its immense wings, and which is retained for a lengthened period. Mr. Holdsworth aptly remarks of the examples he saw at Aripu:—"Their action, as they hung as it were against the gale, slowly swaying first on one side, then on the other, strongly reminded me of the behaviour of a large paper kite when it has mounted high in the air." I learn from my correspondent Mr. Parker that the bird shot by Mr. Smart, when wounded, flew at his dog and seized him by the nose, beating the dog off.

Nidification.—Large numbers of this species nest on Raine Islet, in Torres Straits; and there must be other localities in the Australian seas where it breeds. In Raine Islet Commander Ince, R.N., found it breeding on the south-west corner of it, the nests being constructed of small sticks collected from shrubs and herbaceous plants which alone clothe the island. The eggs were two in number, larger than those of the Gannets (*Sula serrator*? and *Sula cyanops*?), and pure white. He remarks that on one occasion he killed the old birds from a nest which contained one young one, and that on revisiting the spot he found the young bird had been removed to another nest, the owners of which were feeding it as if it had been their own.

APPENDIX I.

Page 17.—*Circus macrurus.* An error in the distribution of this species, with regard to Spain, occurs at p. 19. Col. Irby states, in his 'Birds of Gibraltar,' p. 33:—"On the Spanish side it is not uncommon in spring near Seville. Lord Lilford was the first to obtain it, in the spring of 1872."

Page 47.—*Neopus malayensis.* This Eagle has lately been procured in Sumatra. Mr. Bock, the collector sent to the island by the late Marquis of Tweeddale, met with it at the latter end of 1878, and it is included by Capt. Wardlaw Ramsay in his list published in the 'Proc. Zool. Soc.' for the present year, p. 14. Wallace is the only other naturalist that has recorded it from the island.

Page 51.—*Spizaetus kelaarti.* I see Mr. Hume, in his republication of my description of this species, considers its validity still a matter of doubt, in spite of my examination of such a large series, and having given a woodcut of the feathers. There can be no question about the matter; and Mr. Gurney agrees with me that it is a good species. This gentleman has received another example, sent by Mr. A. Whyte, of Kandy, in the summer of 1878; he informs me that it is a very fine specimen.

Page 55.—*Spizaetus ceylonensis.* With regard to my explanation of the plate (p. 60), I regret to say that, after all, the dark bird which was in the Zoological Gardens is not figured. It died, and I sent the skin to Mr. Keulemans; and after keeping it eight months, in spite of my repeated entreaties that the Plate might be done, he drew another bird, which I had previously sent him, and which does not represent the dark race at all!

Page 67.—*Haliaetus leucogaster.* Mr. Parker writes me of a nest he found at Kalpitiya, on April the 3rd, 1880:—"All round the inner edge of the nest were fish-bones, apparently arranged purposely; under the nest was the skull of a small red deer, showing that these fine birds occasionally kill large game."

Page 72.—*Polioaetus ichthyaetus.* Mr. Parker says, "This Fish-Eagle is rare in the N.W. Province." He only once saw it at Nikaweratiya.

Page 80.—*Milvus govinda.* Captain Wardlaw Ramsay records the obtaining of this species in Sumatra, for the first time, by Mr. Carl Bock in 1878.

Page 94.—*Baza ceylonensis.* It has recently been shown by Mr. Gurney that this new species is not peculiar to Ceylon, and I must therefore expunge it from the list of the "peculiar birds" of the island. Mr. Gurney writes, in 'Stray Feathers,' 1879, p. 445, that he has compared the *Baza* from the Wynaad, sent him by Mr. Hume, with two skins of *Baza ceylonensis*, and that he has no doubt it belongs to the same species. It will be remembered that Mr. Hume was of this opinion at the time he received the specimen himself from the Wynaad (see my footnote, p. 96).

Page 98.—*Baza lophotes.* Mr. Parker found this species common on the road from Padeniya to Anaradhapura from January till March 1880. On one occasion a flock of four were seen together.

Page 101.—*Falco peregrinus.* During the present nesting-season (June 1880), I met with a pair of these birds which had a nest at the celebrated Bird-rock, Merionethshire; they were both in the immature spotted plumage. The female flew round for *five hours* during my stay at the rock, perpetually uttering her querulous cry—*kra, kra, kra, kra.* As an instance of the powers of these birds, I may mention that I was informed by the keeper of the estate that he saw

five Jackdaws struck down one morning in quick succession by the female. The man's remark was that she "seemed to be amusing herself!"

Page 106.—*Falco peregrinator.* Mr. Gurney, who has recently made a critical examination of my Ceylonese specimens and a series of Indian Peregrines from the mainland, is disposed to consider *F. atriceps* from the Himalayas a geographical race of *F. peregrinator*, "distinguishable by its abundant transverse markings, lack of rufous colouring, and prevalent grey tints on the abdominal and tibial plumage." The measurements of an example obtained at Dharmsala are—wing 12·95, tarsus 2·0 inches.

Mr. Parker writes me that he has recently discovered a breeding-place of this Falcon in Ceylon. The eyrie is situated in the face of a large rock near Anamaduwa, on the Puttalam and Kurunegala road. He is informed by a Buddhist priest, who lives there, that a pair breed regularly every year. Captain Wade-Dalton tells me that it was in 1874 he shot his specimen, not 1875.

Page 131.—*Bubo nipalensis.* Mr. Bligh speaks (*in epist.*) of the rapacity of this Owl; a young bird, which was taken from a hole in a tree in Haputale, and not old enough to cater for itself, nevertheless pounced on a village fowl when captured, and tore its head off!

Page 135.—*Scops bakkamuna.* Mr. Hume is at issue with Mr. Sharpe and myself, in the matter of uniting the rufous form *S. malabaricus* with this species. He considers it a good species, and says he has seen it from Ceylon. The only rufous specimens I saw in the island were assuredly nothing but a rufous phase of *S. bakkamuna*, and what I have examined in the British Museum appear to me to be the same. On page 136 I allude to one of these Owls as a rufous variety of the common species. It unfortunately escaped from captivity. It must be remembered there is a rufous phase of *Scops minutus*, and further that the same character exists in other species. Should, however, further investigation prove that this rufous Scops Owl is a good species, and that certain specimens from Ceylon belong to it, then there will have to be added to the avifauna of the island Scops malabaricus (The Malabar Scops Owl).

Scops malabaricus, Jerdon, Madr. Journ. xiii. p. 119. no. 43; Sharpe, Cat. Birds, ii. p. 94 (1875, in part); Hume, Str. Feath. 1879, p. 83 (List B. of Ind.).
Ephialtes malabaricus (Jerd.), Hume, Rough Notes, ii. p. 402 (1869).

Adult females. "Length 8·0 to 8·4 inches; wing 5·95, expanse 16·5; tail 2·75; tarsus 1·05 to 1·08." (*Hume.*)
"Iris dark yellow [that in my specimen, p. 136, was dark brown]; bill yellowish horny, darker above; feet yellow." (*Ibid.*)
Markings as in *S. bakkamuna*; but the parts above which are grey and buff in that species are deep brown and rufous; the chin, throat, ruff, and under surface rufescent, instead of whitish.

Obs. Mr. Hume remarks, in his description, "a good deal smaller" than *S. bakkamuna*; but this is not the case (according to the above measurements) as regards Ceylonese examples of the latter, some females of which measure only 5·7 inches in the wing, and none reach to the limit (6·75) given by Mr. Hume.

Distribution.—Ceylon (*Hume*); the southern parts of India, more particularly the mountain-regions; East and West Ghauts. Mr. Bourdillon has met with this species in the mountains of Travancore; and Jerdon records it from the Malabar coast.

In Ceylon, if such a species is found there distinct from what are unquestionably rufous varieties of *S. bakkamuna*, it will most likely occur in the damp jungle-tracts of the west and south-west of the island, and on the western and southern spurs of the mountain-zone, including the hills of the Kukkul Korale and the surrounding wooded tracts.

In its habits and note this species must be quite similar to the Grey Scops Owl.

Page 161.—*Phodilus assimilis.* Mr. MacVicar recently possessed a fine living example of this curious Owl. It lived in captivity four months, and was then killed in order to figure in the Colombo Museum. This gentleman writes me that he put it into a cage with two Little Scops Owls, one of which, he says, appeared to die of fright; the following morning nothing but the legs and head of the other were left! It is no wonder, therefore, that my correspondent remarks that this cannibal was "an awful fellow to eat, though he went about his work very gingerly, with the side of his beak, as it were."

Page 168.—*Palæornis eupatrius.* Mr. Parker has found this Parrakeet breeding in the N.W. Province, near Uswewa, in February and March. It lays in holes in trees, from 18 to 30 feet from the ground, and chooses open spaces and garden-clearings in the jungle. He has not succeeded in getting the eggs, but took a nest with three young ones; the hole was about 18 inches deep.

Page 174.—*Palæornis cyanocephalus.* In the "Observation" on this species (p. 175) I erred in considering that Gould had, by a *lapsus calami*, inverted the specific names at the heads of the articles on *Pal. rosa* and *Pal. cyanocephalus* in his 'Birds of Asia.' I overlooked his remark "that probably the names of the species would some day require transposition."

Mr. Hume (Str. Feath. 1879, p. 187) takes exception to Mr. Blanford's remark, in his criticism of the "List of the Birds of India," that I had rightly shown the Indian bird to be *P. cyanocephalus*, and refers to the late Marquis of Tweeddale's enunciation that this title belongs to the Burmese race, and says that I must show clearly wherein the Marquis was in error. To which I answer that it is possible the Marquis of Tweeddale was right, but that I do not think the matter is quite satisfactorily proved. This author merely states that Linnæus's title *P. cyanocephalus*, founded on Brisson's *Psittacus cyanocephalus*, applies to this race (the Burmese). Now it is quite impossible to say what species the *rough woodcut* in Brisson's work is intended to portray. It looks like a young bird; but, whatever it is intended for, it is not sufficient basis on which to determine two species so nearly alike as the Indian and Burmese Rose-headed Parrakeets. If we turn to Brisson's lengthy description in French, we find no mention whatever of the female having the red spot on the shoulder, and we find the under wing-coverts described as "d'un verd d'aigne-marine"*, which is a sufficiently good description of those of our bird, and applies better to it than to the Burmese race, in which this part of the wing is *blue*. On the other hand, Boddaert's plate resembles this latter species more than it does the Indian; and Latham's description of the "Rose-headed Ring-Parrakeet" ('Synopsis'), to which Boddaert refers in giving his name *Palæornis rosa*, applies to both species about equally well. I do not, therefore, consider that there is sufficient evidence to warrant our accepting the mere enunciation that the title *cyanocephalus* should apply to the Burmese bird.

Page 177.—*Palæornis calthropæ.* In my "Observation" on this species I make mention of its near South-Indian ally *P. columboides*, Vigors. Layard, in his "Notes on the Ornithology of Ceylon" (Ibis, 1880, p. 284), refers to a note of Blyth's in the Appendix, No. 2, p. 314, Cat. B. Mus. S. India, on a young male of this latter species sent to this author from Ceylon by him, and remarks that he had overlooked the matter in his catalogue. Now I fear we cannot accept this identification of Blyth's as correct. Certain species of *Palæornis* are quite local, and among these are *P. columboides* (confined to the mountains of Southern India) and *P. calthropæ* (restricted to the hills of Ceylon and their immediate entourage). The latter bird has never been seen in South India, and it is extremely improbable that the former has ever wandered into Ceylon, as every one knows that the Psittaci do not straggle in the same manner as Accipitres and Passeres. Were it a question of a Hawk or a Warbler one would not be sceptical. But as no one has ever heard of the Parrakeet in question being seen or met with in Ceylon since the time Layard is supposed to have procured the young male in question, the natural inference is that the specimen was the young of *P. calthropæ*.

I will, however, give a description of the South-Indian species, so that if it ever does occur in Ceylon my readers may identify it.

PALÆORNIS COLUMBOIDES (*Psittacus columboides*, Vigors, Zool. Journ. 1830, p. 274).

Male (Coorg; B. Museum). Length (from skin) to front of cere 14·0 inches; culmen 0·9; wing 5·8; tail 8·5; tarsus 0·5; longer outer toe 0·7.

Iris yellow, bill red; under mandible dark; legs greenish plumbeous.

Head, hind neck, sides of neck, and cheeks delicate bluish slate; lores and round the eye grass-green; from the base of the mandible round the neck a black collar, bordered beneath by an edging of bright green, tinged with bluish; back bluish green, passing into darker green on the wing-coverts; tail greenish blue, the inner webs of the feathers yellow, and the outer edges near the base green; point of the wing blackish slate, passing into dusky green on the rest of the wing-coverts; margin of the median and greater wing-coverts pale tipped; primaries blue, 1st quill black, inner webs (except at the tips) blackish; chest slaty grey, passing into green on the lower breast and abdomen; under wing pale blue, bases of the feathers dark.

Juv. male (Madras). Dusky blue on the head and hind neck; back greenish; wing-coverts and tertials green; point of the wing blackish; rump blue; an incomplete dark ring round the neck; a trace of the green border beneath it; under surface dull green; cheeks greenish.

This fine Parrakeet inhabits the jungles on the mountains of Travancore, the Wynaad and Coorg districts, and the Nilghiris. In Travancore Mr. Bourdillon says it does not ascend to the tops of the hills, nor is it found quite at their base.

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* "*Aquamarine* includes clear beryls of a *sea-green*, or pale bluish or bluish-green tint."—*Dana's 'Mineralogy,'* p. 198.

It affects, according to Jerdon, the depths of the forest; but Mr. Bourdillon affirms that it is found "on the margin of heavy jungle, but most abundantly in the secondary growth on land which has once been occupied by the hill-men." According to Jerdon, "its flight is rapid and elegant, and it associates in small flocks; its cry is mellow, subdued, and agreeable, and it feeds chiefly on fruits of various kinds." It breeds in January and February in the natural cavity of a tree, laying from two to four eggs, of a glossy white colour.

Page 180.—*Loriculus indicus.* My readers must note that the figure of the adult on the Plate facing the article on *Pal. calthropæ* is drawn to a $\frac{3}{4}$ scale, while that of the young bird on the Plate facing the article on *Xantholæma rubricapilla* is life-size.

Page 184.—*Picus mahrattensis.* This species, writes Mr. Parker, is very common in the Manaar district, breeding in dead trees, in which it makes a hole about $2\frac{1}{2}$ inches in diameter. The nesting-season is in May.

Page 186.—*Yungipicus gymnophthalmus.* The same valuable correspondent sends me the following interesting note from the Manaar district on this little Woodpecker. Speaking of the nest, which he found on the 8th of April of the present year, he says "it was situated in a dead tree on the side of a paddy-field; but the tree was so rotten and the branch so weak that I could not obtain the eggs: the hole seemed about 1 inch in diameter and of an elliptical shape, the branch being, at this place, about 3 inches in diameter and slightly sloping, the nest being on the underside. I should not have observed it but for the cries of a Red-fronted Barbet, which probably had a nest in the same tree. The Barbet was perched on the top of one of the higher branches, and was screaming in a most peculiar manner. For a long time I could not discern what was the cause; but at last I noticed the little Woodpecker very slowly, but yet in a way that showed he 'meant business,' edging herself sideways towards the other miserable bird. After taking a step or two she stopped to tap the branch, and as she approached the Barbet this tapping was quite as loud as of one of the larger Woodpeckers. I was in hopes I should see another battle-royal, like that between the two *Brachypternus ceylonus*" (see p. 204); "but when only a few inches separated the duellists the Barbet's little remaining courage gave way and she flew off to another tree. The Woodpecker immediately followed, alighting about a couple of feet below, and at once began quietly to sidle towards the objectionable intruder, pretending all the time to be busily seeking for food, till the Barbet finally flew off." This anecdote is very interesting, as showing the methodical, yet plucky, nature of this pigmy among Woodpeckers.

Page 191.—*Chrysocolaptes festivus.* I have received a very fine example of this handsome Woodpecker from Mr. Parker. It is from the N.W. Province, and is quite as fine a bird as most Indian specimens.

Page 197.—*Chrysophlegma xanthoderus.* Mr. Hume points out (Str. Feath. 1878, p. 517) that Jerdon's name *Picus chlorigaster* has a few months' precedence of Malherbe's, as the number of the 'Revue Zoologique' in which the latter name was published did not issue until the end of 1845, whereas No. 31 of the 'Madras Journal' appeared in February of that year. I had overlooked the precise date, as regards *month*, in which the number in question of the 'Revue Zoologique' appeared; and as Malherbe's title (as a MSS. one) dated from the preceding year, 1844, I took it in preference to Jerdon's. The proper name of this Woodpecker is, therefore, CHRYSOPHLEGMA CHLORIGASTER.

Prior to my use of Malherbe's name *xanthoderus*, this Woodpecker was known in all Indian writings by the erroneous title of *C. chlorophanes.*

Page 200.—*Micropternus gularis.* This Woodpecker makes its nest in the interior of the pendent nest of the black ant. After devouring all the inhabitants it hollows out the interior, which serves as the receptacle for its eggs. Mr. Parker writes me of one about which there were numbers of ants still unconsumed when he first found it, but the last time the bird flew out they had all disappeared. He was, at the time of writing, awaiting the laying of the eggs.

Page 202.—*Brachypternus ceylonus.* Last year Mr. Parker kindly brought home two eggs of this species which I intended to have figured in my Plate, but they unfortunately were destroyed by a pet dog. They were glossy white and broad ovals in shape. One specimen measured 1·16 by 0·85 inch. A second nest, found in the N.W. Province on the 30th December last, was in a small dead tree about 18 feet from the ground; the hole was $2\frac{1}{2}$ by 3 inches, a vertical ellipse leading into the middle of the trunk and then down a foot. There were two eggs, "rather pointed at the small end, but not quite similar in shape, one being more elliptical than the other."

Page 205.—*Brachypternus puncticollis.* Mr. Parker informs me that he has seen yellow-backed and orange-backed Woodpeckers on the Manaar and Madewatchiya road, twenty-three miles from the sea; they were not in company, and he is inclined to think the orange-backed bird (*B. intermedius*, nobis) is a good species. I never met with the yellow-

backed birds so far into the forests as this, and I did not like to split the species into two; but I am convinced that *B. intermedius* is a forest *race*, if nothing more, of *B. puncticollis*. It will probably have to be added to the list. From observation of both races, which meet in the Giants'-tank district, he finds that they do not associate together, and have slightly different habits, which one can notice better when both are seen in the same locality. It would be interesting to know whether such is the case on the borders of the hill-forests in the south of India. Its note is different from that of the Golden-backed Woodpecker, resembling that of *B. ceylonus*, but not so much a scream, and continued for less time.

The female specimen mentioned in my explanation of the plate (p. 207) has been omitted.

Page 212.—*Megalæma flavifrons*. The bill of this species (Plate to face article on *M. zeylanica*) is wrongly coloured. Almost throughout the entire series of Plates the accurate colouring of the "soft parts," in accordance with my data on the labels of the specimens, has been disregarded by my artist Mr. Keulemans. Alterations had frequently to be made, but in this case the defect was overlooked.

Page 258.—*Zanclostomus viridirostris*. Mr. Parker has kindly presented me with two eggs taken from a nest of this Cuckoo found in the N.W. Province near Uswewa. They are pure white, short, broad ovals, very rounded at the ends, slightly rough in texture, and measure 1·17 by 0·97 and 1·17 by 1·0 inch. They were taken in the early part of 1879.

Page 260.—*Centropus rufipennis*. With regard to this Ground-Cuckoo's habit of killing snakes, I append an extract from some MS. notes of the late Mr. E. L. Mitford, Government Agent at Ratnapura, and one who was an accurate observer of birds. Speaking of one of these birds he says, "I saw the Cuckoo attack and kill a long green whip-snake. It chased the snake through the branches of a tree till it fell to the ground, and then attacked its head from behind. The snake tried to bite the aggressor in the neck, but it seemed to bite only the feathers; and at one time the bird was enveloped in its coil. After disabling it by repeated blows on the head the Cuckoo seized it by the neck and flew off to the jungle, the tail of the snake catching and winding round the sticks and branches it passed over and checking the bird's flight."

Page 275.—*Tockus gingalensis*. This bird will thrive in confinement. Mr. Parker kept one for a month, and it was doing well when a cat killed it. It fed readily on plaintains, given it in pieces, which it tossed down its throat with a jerk of its head.

Page 278.—*Upupa nigripennis*. This species should stand as UPUPA CEYLONENSIS of Reichenbach. I erred in using a MS. name, the date of which (though I could not ascertain it from Mr. Gould) is known to have been prior to Reichenbach's *ceylonensis* (1851). Mr. Hume has corrected my mistake (Str. Feath. 1878, p. 517); I did not, however, intend 1856 to stand as the first date for *nigripennis* of Gould.

Page 285.—*Eurystomus orientalis*. This handsome and, in Ceylon, rare species was obtained on the Dammitenne Estate, Lemastota, by a collector of the Colombo Museum, in the early part of 1879; and Mr. Bligh, my informant, saw an example again a week afterwards in the same valley. At this elevation, about 2500 feet, and from that to 1500, I think it is generally seen in the hill-districts.

Page 303.—*Ceyx tridactyla*. On the Arrive aar or Malwatta oya, some distance inland from Aripu, Mr. Parker tells me that this species is as plentiful as the large Buff-breasted Kingfisher, *Pelargopsis gurial*. He remarks on their habit of washing themselves, a somewhat abnormal one in a Kingfisher, one would think. They wash like Flycatchers, "darting down from a branch, and barely dipping themselves under water."

Page 306.—*Merops philippinus*. This Bee-eater, which has been recorded by few from Sumatra, is mentioned by Capt. Wardlaw Ramsay as having been obtained there by Mr. Carl Bock in 1878.

Page 309.—*Merops viridis*. The colour of the legs of this species varies. I find it recorded in my field-notes as "fleshy grey;" "brown, with grey edges to the scales;" "brownish;" "blackish, with pale edges."

Page 312.—*Merops swinhoii*. Levaillant's name should be expunged from the synonymy. This species breeds in the North-western Province in April. From the Nikaweratiya district Mr. Parker sends me some particulars concerning its nidification. The nests were excavated in a bank by the roadside near the Deduru oya, and were about 2 feet 6 inches deep, with an enlarged chamber at the end similar to that mentioned at p. 313. Between 7 A.M. and 2.30 P.M. a pair

excavated a hole 8 inches deep; the soil was sandy, such as could be "cut by a sharp-pointed stick without difficulty." One nest contained four eggs of about the same date of laying; another, two young ones and four eggs, one of which was on the point of hatching off, and one perfectly fresh—showing that they are laid very irregularly.

Page 314.—*Chætura gigantea.* Mr. Hume, I observe ("List Ind. Birds," Str. Feath. 1879), still retains the name *C. indica* for the Indian birds. I have shown, on examination of a series from widely extended localities, that the species is decidedly variable in the matter of the *white patches.*

Mr. Bourdillon (Str. Feath. 1878, p. 34) calls attention to the wonderful flight of these Swifts:—"It is magnificent," he remarks; "their speed almost incredible; the rushing noise as they dart through the air quite startling. I was much interested the other day in watching a flight of these Swifts feeding on a crowd of termites that, as usual, were swarming up from their underground nest. I was close enough to see that, at the instant of capture, the Swifts detached and rejected the wings of their prey."

Page 324.—*Collocalia francica.* This Swiftlet is noticed by Capt. Wardlaw Ramsay as having been obtained in 1878 by Mr. Carl Bock in Sumatra.

Page 328.—*Dendrochelidon coronatus.* Males from India have more rufous about the chin and cheeks than Ceylon examples; this colour extends from the chin across the lower part of the face to the ear-coverts, forming a conspicuous facial coloration. I do not know whether this trifling difference is constant. The tints of the plumage are otherwise the same as in Ceylonese specimens.

Page 355.—*Oriolus diffusus.* With regard to this title of Mr. Sharpe's, which I adopted for the Black-naped Indian Oriole, and my remarks in the "Observation," setting forth the grounds which that author had for altering the name hitherto employed, I observe a note of Mr. Hume's (Str. Feath. 1878, p. 392, B. of Tenass.), calling attention to facts which I had overlooked. The name *indicus* is one of Jerdon's, not Brisson's, which are indeed, as Mr. Hume points out, inadmissible. The former author observes, in the 'Illustrations of Indian Ornithology,' after remarking on the invalidity of the title *chinensis*, "I have therefore given our peninsular species the appellation of *indicus*, partly because I consider that *O. indicus* of Brisson and others may possibly refer to this, though faultily described." I desire, therefore, to restore the usual title to this bird, and it will stand in the 'Birds of Ceylon' as ORIOLUS INDICUS.

Page 360.—*Graucalus macii.* This Shrike breeds in the North-west Province in July and August. The birds are very partial to Palu-trees, and in them they build, constructing a small nest of grass fixed *on* a branch, and scarcely visible from the ground beneath. Such a nest, found by an overseer of Mr. Parker's, contained two young birds; another nest, situated at the top of a Palu-tree, and to which this gentleman watched one of the owners carrying grass, was externally a large nest of small sticks (perhaps an old one of some other birds), lined inside with grass and leaves. It was fixed in the fork of a small branch.

Page 366.—*Pericrocotus peregrinus.* Nests of this Minivet found in the Manaar district are described to me by Mr. Parker as beautiful little structures, "made entirely of small leaf-stalks laid parallel, wound round and round with spider's web, and covered all over with little patches of lichen. The nest is," he writes, "always on the top of a small overhanging branch (generally that of a wild mustard-tree); and so cleverly does the colour resemble the bark, that when I found my first nest, not more than 6 or 7 feet from the ground, I stared at it for several minutes before I knew it was one, though I saw the bird fly off it. The nest is firmly glued to the branch, so tightly, in fact, that it must almost be torn off piece by piece. It is cup-shaped, $1\frac{3}{4}$ inch wide and $\frac{3}{4}$ inch deep." The eggs are described as of a delicate rich green ground-colour, spotted with purple; but they fade in about a fortnight after being prepared.

Page 369.—*Lalage sykesi.* In the synonymy I omitted the reference to Mr. Holdsworth's Catalogue, which is Proc. Zool. Soc. 1872, p. 437.

Page 372.—*Tephrodornis pondicerianus.* I am now able to give some particulars concerning the nesting of this Wood-Shrike in Ceylon. Mr. Parker writes me from Manaar of a nest containing two eggs recently found by him:—"It was on the lateral branch of a 'mustard-tree,' near the end, and much resembled the nest of *Pericrocotus peregrinus*, but was flatter and wider, and was made of chips of dead wood, dead grass, and dead lichen, tied together with spider's webs, and lined with the same mixed with a few fine fibres of bark." Its measurements were $2\frac{1}{2}$ inches wide and $\frac{1}{2}$ inch deep, and it was glued to a branch about 7 feet from the ground. Another nest found was constructed in the same manner.

Page 383.—*Lanius caniceps.* Numerous nests of this Butcher-bird have recently been found by Mr. Parker in the Manaar district, where it breeds from the beginning of March to the end of April. "The nests are," writes this gentleman, "almost invariably built in a thick thorny tree, from 7 to 15 feet from the ground, cup-shaped, measuring $2\frac{3}{4}$ or 3 inches in width and $1\frac{3}{4}$ inch in depth, with thick walls made of roots and grasses, often tied together with thread or bits of rag from some neighbouring village, or patches of wild cotton, and lined with fine grasses." They are in most open situations, often on the roadside, without any attempt at concealment, as if the bird trusted rather to the natural protection of the terrible thorns of that district. Mr. Parker writes me further that this Shrike is very pugnacious. A young brood, reared near his bungalow at the Giants' tank, demonstrated their pugnacity in an interesting manner, attacking any thing that came in their way. He observes (*in epist.*), "one of them seemed anxious to fight a squirrel the other day, chasing it for 20 or 30 yards along the compound fence, creeping in and out like a rat. The squirrel seemed undecided whether to be amused or alarmed, but the balance seemed in favour of the latter."

Page 386.—*Buchanga atra.* This Drongo extends inland down the Madewatchiya road from Manaar for 23 miles; so writes me Mr. Parker. It nests at the end of March, building on an overhanging branch among the leaves at the end, and not on a fork, like *B. leucopygialis.* The nest resembles, says this gentleman, that of *Lanius caniceps*, and is not built higher than about 10 feet from the ground. Layard, in his recent paper already referred to, maintains that he found *B. longicaudata* perching on the backs of cattle at Pt. Pedro; but I still retain my opinion that the Drongo found at Jaffna perching on the backs of cattle is the present species. *B. longicaudata* is a forest species. Blyth was not always correct in his identifications.

Page 392.—*Buchanga leucopygialis.* This bird sometimes holds its prey in its foot, after the manner of a Parrot, that is, if the insect it has caught is very large or too bulky to be swallowed instantly. With reference to Layard's remarks (Ibis, 1880, p. 284) as to there being some "confusion under this head," I must refer him again to the working-out of the plumages, whereby he will see I have united the *B. cærulescens*, apud Blyth, from Ceylon, and *B. leucopygialis*; also he will see that my remarks as to the species he found at Pt. Pedro refer to the "*light form*" of *B. leucopygialis* (*B. cærulescens*, apud Blyth). The true *B. cærulescens* is not found in Ceylon.

Page 399.—*Dissemurus paradiseus.* There appears to be no fixed rule for the shape of this bird's tail in youth! Mr. Parker writes me that on May 7th, 1879, in the Uswewa district, he shot one of two young birds flying about with their mother, which of course had the tail-feathers in the ordinary racket-shape; but those of the young bird were perfectly straight, without a trace of a curl; the other young one appeared to have a similar tail. The specimens referred to in the last paragraph of my "Observation" can, I think, after all, scarcely be considered to form a new race; they simply illustrated cases of abnormal formation of the outer tail-feathers.

Page 404.—*Terpsiphone paradisi.* I omitted to state that males commonly breed in the *red* plumage; indeed from what I learn it is the exception to find a white male paired in Ceylon, though such is the case occasionally, for the late Mr. Lorenz, of Colombo, who took a great interest in the birds of his native country, wrote me, when I first went to the island, of a pair, white and red, breeding together. Capt. Wade-Dalton has a specimen (white) in which the central tail-feathers are $18\frac{1}{2}$ inches in length, projecting $13\frac{1}{2}$ inches beyond the adjacent feathers. Mr. Wickham, of Holmwood, Lindoola, writes me that he has seen this bird once at his estate, which has an elevation of 5200 feet. This is by far the greatest altitude at which I have heard of its being seen; it was probably on passage across the mountains to the Eastern Province.

Page 417.—*Alseonax muttui.* Capt. Wade-Dalton procured a specimen of this Flycatcher in Kottowe Forest. Collectors for the future in Ceylon should particularly look for this species in the forests during the S.W. monsoon, as further evidence is much wanted to prove that it is not migratory, but peculiar to the island.

Page 446.—*Larvivora brunnea.* I see Mr. Hume uses the later title *L. superciliaris* of Jerdon for this Woodchat. There can be no doubt, I think, that *L. brunnea* was the female of this species, and as such it ought to be the title employed, notwithstanding that it is not very applicable to the *male* bird.

Page 449.—*Turdus kinnisi.* It is to be hoped that further specimens of this species will be procured in the Travancore hills. I do not think it is as yet *satisfactorily* proved that the race from the latter region is not larger than the Ceylonese, and consequently distinct. I should be glad to see the "Nuwara-Eliya Blackbird" reinstated as a *peculiar* Ceylon bird.

Page 451.—*Turdus spiloptera.* Mr. Seebohm classes this and all spotted Thrushes with a pale bar on the under wing as *Oreocincla.*

Page 457.—*Geocichla citrina.* It is now satisfactorily proved that this species is migratory to Ceylon, as I suggested that it must be (p. 458). In October last (1879) an example was captured in the lower story of the Surveyor-General's office in Colombo, Mr. MacVicar being present at the time. Like the Ceylon Rail, which is found in houses about Colombo, it had just landed and taken refuge in the large building in question. It is evident that the bird shot by the late Mr. F. Gordon at Jaffna was likewise a new arrival in the island.

In my note, p. 158, on *Geocichla rubecula* from Java, I have erred in stating that it has no wing-spot. It is *G. albogularis*, Blyth, common in the Andamans, which is devoid of the bar on the wing-coverts.

Page 477.—*Rubigula melanictera.* The tail of the figure of this species has been coloured too hard a green.

Page 482.—*Pycnonotus hæmorrhous.* I hope that Mr. Hume will see his way to restoring this bird to its old-established genus *Pycnonotus*, for which he has substituted a new one (*Molpastes*), under which this bird and its allies are placed in the "List of the Birds of India."

Page 507.—*Alcippe nigrifrons.* Eggs recently received from Mr. Parker entirely resemble those in my own collection taken in the north. There is a little variation in the size, one of the specimens measuring 0·77 by 0·55 inch. On the whole the eggs are very large for the bird.

Page 509.—*Pellorneum fuscicapillum.* The nest of this species was found by Mr. Parker in the N.W. Province, and one of the eggs kindly given me by him is figured (No. 17) on the Plate. It is a moderate oval in shape, slightly compressed from the middle to the small end; the markings are pale red-brown, arranged in the form of a confluent cap at the large end, from which small specks and larger blots diminish towards the small end. The cap is overlaid with brown blotches in the form of a zone near the end. Dimensions 0·78 by 0·55 inch.

Page 520.—*Prinia socialis.* Through the kindness of Dr. Edie, of the Madras Museum, I now possess two specimens of *Prinia socialis* from Collegal, S. India, which, on comparison with my Ceylon skins, prove to be slightly different, though not quite so much so as Sykes's type, referred to in my article. They are two males, measuring—wing 1·9–2·0 inches, *tail* 2·2–2·4, tarsus 0·8, middle toe 0·52, bill to gape 0·62–0·65.

The wing-coverts and secondaries are edged, as in Deccan birds, with brownish rufous, the upper tail-coverts are tinged with the same, and the tails are paler brown, with the subterminal bar smaller than in the Ceylonese form. The difference in the wing-colouring is very conspicuous, almost as much so as the much greater length of tail. These specimens form a link between the Deccan birds and the Ceylonese, but resemble the former more than the latter; our bird should therefore stand, in my opinion, as PRINIA BREVICAUDA (*vide* p. 521), a new subspecies *apparently* peculiar to Ceylon, but which, I regret to say, it is now too late to figure.

Page 529.—*Drymœca insularis.* Dr. Edie, of the Madras Museum, has kindly sent me three specimens of the small Wren-Warbler (*D. inornatus?*) from South India. There is but little difference between them and our Ceylonese birds which I have given the above title to, and I do not think it will eventually stand, although, so far as I can judge from a limited number of Indian specimens, these South-Indian birds are different from Sykes's type noticed in my article. Then, again, do they lay spotted eggs, or eggs marked with hair-like streaks?

Page 532.—*Schœnicola platyura.* The article on this species should, perhaps, not be placed as a footnote in this work, as there is no question about the bird (so says Mr. Sharpe) having been procured in Ceylon. My reason for so treating the notice of this species was that the bird was not satisfactorily determined. As I said before, I do not see how we are ever to ascertain what *Schœnicola platyura* of Jerdon really was.

Page 541.—*Acrocephalus stentorius.* Mr. Parker found this Warbler numerous in January last, at Ataragalla tank, which is not far from Balalli, on the Anaradhapura road to Wariyapola.

Page 555.—*Phylloscopus viridanus.* Layard (Ibis, 1880, p. 285) is in error about the fourth species of *Phylloscopus*, which, he says, I have overlooked. *Phyllopneuste montanus* (Horsfield), apud Blyth, Cat. B. Mus. As. Soc. no. 1105, is *Phylloscopus proregulus* (Pall.), apud Blyth, J. A. S. Beng. xxiii. p. 488, the species now known as *P. superciliosus* (Gmel.), which has never been recorded from Ceylon. The skins which were identified by Blyth as *P. montanus* from Ceylon were doubtless the examples of *Acrocephalus dumetorum*, Blyth (a common bird and abounding in bushes in the Jaffna peninsula), which appears in Blyth's Catalogue as *A. montanus* (Sykes), a specimen of which, collected by Mr. Layard in Ceylon, is there recorded. Blyth altered the name *A. montanus* to *A. dumetorum*, because he discovered that the *Sylvia montana* of Sykes was not the same species as the *Sylvia montana* of Horsfield, and that since the latter name had the priority of date, the former name must be laid aside as a preoccupied synonym, and a new name must be provided.

Page 566.—*Cinnyris asiaticus.* Through some inadvertence I have spoken of the nest noticed by Mr. Holdsworth as being in his bungalow at Aripu, instead of in a rest-house in the south of the island.

Page 572.—*Cinnyris minimus.* Layard confirms my supposition that it was at Pt. Pedro where he found this species "not uncommon" (Ibis, 1880, p. 280).

Page 574.—*Dicæum minimum.* This little Flowerpecker is identical with the *Certhia erythrorhyncha* of Lath. Ind. Orn., and must stand in this work as Dicæum erythrorhynchum, Latham, Ind. Orn. i. p. 299 (1790). Mr. Parker writes me of a nest of this tiny bird, recently found at the Giants' tank, and which was suspended from the end of a leafy bough about 5 or 6 feet from the ground. The opening was at the side, and the top was covered over by a hood, as in the nests of *Cinnyris.* The character of the nest is therefore intermediate between that of *Cinnyris* and *Piprisoma.* It contained three young ones almost fledged, which quite filled up the nest.

Page 579.—*Piprisoma agile.* Mr. Parker has sent me a beautiful nest of this little bird, taken in the N.W. Province. It is one of the most remarkable nest-structures that can be imagined. It resembles exactly a brownish-red felt purse suspended to a little branch, with a large opening at the top, extending down the front somewhat. The material is of the consistency of loosely-woven flannel, and the whole nest is entirely in one piece, so that were it not attached to the branch it could be turned inside out like a stocking. It is made of the small brown stamens of some flower, evidently agglutinated to a framework of cotton and spiders' webs, and is about $\frac{2}{8}$ inch thick in some places, in others not more than $\frac{1}{8}$. From the point of suspension to the bottom of the nest is $3\frac{1}{2}$ inches, the greatest diameter of the purse is 2 inches, and the length of the opening $1\frac{3}{4}$ inch by 1 inch in breadth.

Page 579.—*Prionochilus pipra.* Count Salvadori, in 'The Ibis' for January 1880, p. 144, corrects my mistake with regard to this species being a made-up bird, and points out that it is a South-American species of the genus *Iodopleura.*

Page 598.—? *Cotyle obsoleta.* I find, on looking over old letters received from my correspondent, Mr. Parker, that he has observed, at Anaradhapura, a Martin which would appear to be the same as Mr. Bligh's Haputale bird. It is, however, possible that it may be the Common House-Martin (*Chelidon urbica*, Linn.), which visits the Nilghiris occasionally.

Page 633.—In my article on the Indian Sky-Lark, I have referred in the *note* to a further species, to be treated of in the Appendix, concerning which I now have to remark that I am unable to deal with it as satisfactorily as I expected, owing to my not having heard from Mr. Hume as to his opinion concerning the specimen of this race which I sent him twelve months ago last August. Absence from his museum at Simla has, I presume, prevented his comparing the specimen with a requisite series.

On the 27th of June, 1873, I shot a pair of Larks out of a small flock of a dozen or so that were feeding gregariously on the bare plains near the leways at Hambantota. They differ from all other specimens of Larks I have met with in Ceylon in their small size and proportionately stout *Mirafra*-like bill. They are changing from the first or nestling-plumage to the mature dress; and were it not for the stout bill, their small size would indicate them to be the young of *Alauda gulgula.* The specimens, which are males, measure:—Length 5·75 to 6·0 inches; wing 3·1 to 3·05; tail 1·8 to 1·85; tarsus 0·95; middle toe 0·55; hind toe 0·45, its claw (straight) 0·53 to 0·55; bill to gape 0·64, at front 0·5. The bill is considerably stouter than that of fine specimens of the Indian Sky-Lark, but has not the massive curved form of the bill of the *Mirafra* or feathered-nostrilled Larks, nor such a conical one as *Spizalauda.*

Iris fulvous brown; bill and upper mandible blackish, with a pale edge, lower mandible fleshy; legs and feet olive-brown, joints dark plumbeous.

The feathers of the head and interscapular region are black, the margins rich rufous on the head, rufous-grey on the back; wing-coverts and tertials broadly margined with rufous; the primaries edged outwardly with rufescent white; the nestling tail-feathers are very pointed; the lateral newly-acquired ones rufescent white, with dark inner edges; lores and a broad supercilium rufescent white; the new feathers of the throat and chest pale rufous, as also those of the thighs; the nestling-feathers of the under surface whitish; across the chest the feathers are striped with dark brown.

The second example has none of the bright rufous coloration of the one described.

I compared both with a specimen of *Alauda malabarica*, the South-Indian form of Sky-Lark, sent to me by Canon Tristram, as also with examples of *Spizalauda deva*, lately contained in the India Museum, and I do not find that it corresponds with either. Owing, however, to the very poor series of Indian Larks to which I have had access, I am unable to declare this Ceylonese form to be new or not. If it be so, I would propose the name of *Alauda parkeri*, in honour of my valued correspondent, Mr. H. Parker, of the Ceylon Public Works Department.

Page 646.—*Ploceus manyar.* Captain Wade-Dalton writes me that he has shot this Weaver-bird near Buttawa.

Page 673.—*Pastor roseus.* The year in which Mr. Holdsworth saw a flock of these birds at Aripu was of course 1866. The printer's error, "1856," was overlooked by me.

Page 687.—*Pitta coronata.* Mr. Holdsworth tells me that he has not only heard this bird at Nuwara Eliya in August, but that he has *seen* it more than once there in that month.

Page 702.—*Turtur risorius.* This Indian Turtle-Dove, Mr. Parker tells me, breeds in the Manaar district in April and May. The nest is at varying heights from the ground, and is a thin structure of sticks, like that of the Spotted Dove (*T. suratensis*).

Page 711.—*Turtur pulchratus.* Captain Wardlaw Ramsay thinks that Eversmann's title (*Columba ferrago*, Add. ad Zoogr. Rosso-As. iii. p. 17, 1842) ought to apply to this species, as he described an Asiatic Turtle-Dove having the tips of the rectrices white; whereas Hodgson's name *pulchrata* was bestowed on a bird in Gray's Zool. Miscell., without giving any description. He points out an error I fell into in saying that Latham did not mention what colour the under tail-coverts were in *Turtur orientalis.* I had only referred to his 'Index Ornithologicus,' where such is the case; but in his 'General Synopsis,' ii. pt. 2. p. 647 (1783), he describes the under tail-coverts as "pale cinereous grey."

Page 718.—*Carpophaga ænea.* Mr. Parker, who, I imagine, is the first collector who has taken the eggs of this fine Pigeon in Ceylon, writes me of a nest he found in dense forest in the Uswewa district. It was built of thin twigs, about 20 feet from the ground, in a thick young tree. It contained two eggs, which were unfortunately broken; they were elliptical in shape, and considerably larger than those of the Green Pigeon (*Osmotreron pompadora*).

Page 725.—*Osmotreron bicincta.* The same gentleman has sent me an egg of this species, taken by himself. It is a broad ellipse, and almost the same at both ends, pure white, and measures 1·08 by 0·87 inch. Another nest, found by him in thick forest, is described as constructed in the slightest manner of twigs, about 8 feet from the ground, near the end of an overhanging branch.

Layard reiterates (Ibis, 1880, p. 283) his assertion that this bird has a plaintive whistle. It may be so; but I have heard it make a hoarse croak, and always remarked that it was a much more silent bird than the Pompadour Pigeon.

Page 728.—*Osmotreron pampadora.* Mr. Parker informs me that nests of this Pigeon are common in the north-west in forest in May. They resemble those of the above-mentioned, and were situated at heights varying from 10 to 40 feet; the bird usually prefers the leafy top of a young tree 15 or 20 feet high, but will build also on the overhanging branch of a Bo-tree. The nest is a very thin structure.

Page 736.—*Gallus lafayettii.* As I have given two Plates of this bird, it is necessary to alter the description of the Plate, last paragraph on p. 740, as follows:—The figures on the first Plate represent a cock from the Trincomalie district and a chick shot on the summit of Allegala Peak; those on the second Plate, a female from the Wellaway Korale and an immature male bird from the Kandy district.

Page 755.—*Coturnix chinensis.* I have a specimen of this bird's egg now in my possession, taken at Bolgoda in September. It is yellowish olive, speckled with small clearly-defined specks and points of brownish red; the larger end is almost devoid of the latter markings, but shows the fine though open stippling only with which the egg is covered beneath the specks. It is a broad somewhat pointed oval, and measures 1·03 by 0·77 inch.

Page 761.—*Turnix taigoor.* Captain Wardlaw Ramsay records this Quail as having been procured by Mr. C. Bock in Sumatra. This is the first time that it has been obtained in that island.

Page 781.—*Gallinula chloropus.* A second example of this species was obtained last December at Nikaweratiya.

Page 800.—*Rhynchæa capensis.* Captain Wardlaw Ramsay records the procuring of this species in Sumatra by Mr. Carl Bock in 1878.

Page 821.—*Gallinago scolopacina.* According to Mr. Dresser the Common Snipe should be called *Gallinago cœlestis*, a name given by Frenzel in 'Beschr. der Vögel und ihrer Eier in der Gegend um Wittenberg,' p. 58 (1801). It would, perhaps, be well if this name were adopted by British ornithologists, as it is peculiarly adapted to the habits of the bird in the breeding-season. The title *gallinaria*, as I have already stated, is wholly inapplicable.

It is a pity that Mr. Dresser adopts Herr Meves's tail-theory of the Snipe's drumming, after what has been written by Mr. Hancock and others. In my article on this species, printed on the 13th of January last, and written after I had myself carried out the experiments on which Herr Meves's hypothesis was based, I showed that the conditions under which the tail-feather is moved with the stick and wire on the one hand, and with the caudal vertebræ of the bird on the other, are totally different, and that though a noise may be produced like the Snipe's drumming with the one means, it cannot possibly be by the other. With the intention of referring again to the matter in the Appendix, after I should have had an opportunity of observing for myself, I repaired this season to the breeding-grounds of the Snipe in Mid-Wales, and there had an admirable opportunity of verifying Mr. Hancock's theory that the sound is chiefly made by the wings; and I am now perfectly satisfied that this is the case, notwithstanding that the tail is spread during the performance. I went there partly convinced in my own mind that the sound was a vocal and at the same time a mechanical one—that is, that it was made in the same manner as has been observed in the case of the Great Snipe, with the bill and throat; but it only requires close, very close, observation and good hearing to come to a right conclusion in the matter. The most favourable occasion I had for observation was on the evening of the 10th of June, when the same Snipe, having young near where I was standing, drummed over my head, flying backwards and forwards in the manner now to be described, without cessation, for a period of fifty-two minutes, timed by my watch! It was a calm evening on an immense bog, with the sun gradually sinking behind the wild surrounding hills; and as I stood, binoculars in hand, and with my wire and tail-feather for purposes of comparison of sound, intently watching the remarkable performance of the interesting bird, the time flew rapidly by, and I do not think I ever spent a more pleasant hour in the observation of Nature. There were other birds drumming all round me, for the evening is *the* time for this performance; but I gave my undivided attention to the one which I had particularly alarmed by my proximity to her young.

The aerial course taken by the bird was an ellipse, of the average length of a quarter of a mile, described over where I stood; but it was sometimes varied by her making a figure of "S" above my head, the bird always returning to its original starting-point in the air and again making the same tour. The movement for the purpose of drumming was generally performed twice, but sometimes thrice, going and coming, making from four to six times in each figure described. It flew at a height of about 100 yards with a quick and regular movement of the wings, and drummed in this wise:—the body was suddenly turned on one side and the bird descended rapidly for about 100 feet at an angle of 45 degrees, moving its wings with very rapid and powerful *strokes*, its tail being at the same time opened to the utmost: having arrived at the lowest point of its descent it suddenly turned its body in the reverse direction, that is, elevated the wing which had been before depressed, and with a short upward sweep ceased the drumming noise and rose to its original position, continued its course for a short distance, and then descended with the same rush again. The movement was always performed with the same wing pointed downwards throughout one half of the bird's course; that is, if it commenced to drum with the left wing down when flying from east to west, that wing was inclined downwards the next time it descended, until the course was altered, and the bird flew back from west to east, when usually the other wing was inclined towards the earth. The instant the bird commenced its descent the drumming noise was heard, and it continued till it finished off with a sort of whiz directly the upward sweep, by which the bird recovered itself, was performed. By closely watching the bird it could be distinctly *seen* that the vibrations falling on the ear *coincided exactly with the beat of the wings*, which, assisted by the downward rush through the air, were the *primary* cause of the sound. The tail, however, was spread, as I have already remarked, and to such an extent that it took the form of a fan, the lateral feathers being at right angles to the centre; and herein lies the *secondary* cause of the sound. During the drumming-beats of the wing the quills are more drawn back than in the ordinary strokes (this can be observed if the bird be closely watched), so that the atmospheric wave or air propelled by the powerful stroke of the wing is driven through the rigid, sabre-shaped, and opened-out feathers of the tail, thus making the peculiar noise. If a succession of quick puffs emitted from the lips be brought to bear upon the opened-out tail of a Snipe a peculiar noise is produced, which is analogous to that made by the much more powerful agency of the wings of the bird during the rapid downward rush through the air which it resorts to when drumming; and as the peculiar sound is unquestionably coincident with the beating of the wings, it can only be accounted for on the hypothesis here set forward.

Page 828.—*Gallinago gallinula.* Mr. Simpson, of the Indian Telegraph Department, shot another of these Snipes at the Palverainkadoo lagoon in March last.

Page 885.—*Tringa ruficollis* = *T. albescens*, Temm. With regard to the observation on this species in my article on *T. minuta*, I notice that Mr. Hume recently records this species from the Malay peninsula. I have already stated that I do not think any of the larger specimens of Stint procured by myself in Ceylon belonged to this form; but it is possible that it may visit the island, which would, in that case, be the westernmost limit of its range.

To follow my article on *Limicola platyrhyncha* is the following on an additional species:—

Genus CALIDRIS.

Similar to *Tringa*, but with hind toe wanting.

CALIDRIS ARENARIA.

(THE SANDERLING.)

Tringa arenaria, Linn. Syst. Nat. i. p. 251 (1766).
Charadrius calidris, Linn. Syst. Nat. i. p. 255 (1766).
Calidris arenaria (Linn.), Blyth, Cat. B. Mus. A. S. B. p. 270 (1849); Jerdon, B. of Ind. iii. p. 694 (1864); Heuglin, Orn. N.Ost-Afr. ii. p. 1196 (1873); Hume, Str. Feath. 1873, p. 244, et 1876, p. 465, et 1879 (List B. of Ind.), p. 113; Dresser, B. of Europe, pt. 59, 60 (1877); Feilden, Ibis, 1877, p. 406.
Ruddy Plover, Lath.; *Yamgchurchi*, Turkestan.

Adult male. (Ceylon, 10th Dec. 1879) "Length 7·75 inches; wing 4·75; tail 2·0; tarsus 1·0; middle toe 0·75; bill at front 1·0" (*Haly*). (Sindh) "Length 7·5; wing 4·7; tail 2·0; tarsus 0·92; bill at front 0·93; weight 1·7 oz." (*Hume*).—*Female* (Turkestan). "Length 7·8; wing 4·73; tail 1·95; tarsus 1·0; bill from gape 1·1" (*Scully*).—*Male*. (Missolonghi, Mus. Harting) Wing 4·75; tail 2·0; tarsus 1·0; middle toe and claw 0·8; bill at front 1·0. (South Africa, Mus. Harting) Wing 5·0; tail 2·3; tarsus 1·03; middle toe and claw 0·75; bill at front 0·98. (New Jersey, North America) Wing 5·2; tail 2·4; tarsus 1·1; middle toe and claw 0·75; bill at front 1·07.
Iris brown; bill black; legs and feet black.

Breeding-plumage (Missolonghi). Feathers of the head, lower hind neck, interscapulars, and scapulars black, with broad lateral rufous margins and tips of white, the latter broadest at the ends of the longer overlying scapulars; forehead and hind neck brown, with greyish rufescent edgings to the feathers; in front of the eye a black border preceded by rufous, black-centred feathers, which spread down over the fore neck and throat, where they are conspicuously tipped with white; on the sides of the chest these markings take the form of crescentic bars near the tip; under surface, with the under tail-coverts and under wing, white; back and rump blackish brown, the feathers tipped in some parts with white, in others with rufous; upper tail-coverts black, with the same markings; tail brown, the inner webs of the two centre feathers blackish, the margins of the whole white; lesser wing-coverts blackish brown; median and greater brown, tipped with white; primaries and secondaries blackish brown; the shafts white, with the 2nd brownish at the base; tips and outer edges of the secondaries white; edge of the wing beneath brown; inner primaries with the bases of the outer webs white.
Another example from New Jersey, the measurements of which are given above, is in a peculiar pale phase of plumage:—
Crown, interscapulars, and scapulars black, with broad white edgings, taking the form of marginal spots, on the scapulars; a dark patch through the lores; space above them, forehead, entire under surface, and neck white, the feathers at the back with pale brownish central streaks; point of the wing blackish brown; most of the remaining wing-coverts white; quills as above, but with more white at the base of the inner primaries; back and rump smoky blackish, tinged with buff, and with an almost straight transverse mark near the tip; tail whitish, passing into brown on the outer webs and at the tips of the feathers; the central feathers more darkly coloured than the rest.

Winter plumage (South Africa). Above pale cinereous, the forehead, face, and all the underparts white; the shaft-streaks of the head-feathers blackish brown; the hind neck pale greyish; shaft-streaks of the back-feathers brownish; rump darker than the upper back; tail pale brownish, edged with white, the outer feathers tipped with dark brown; lower wing-coverts brown; wing as in summer plumage.

Young (half-fledged nestling). Back and scapulars black, with rufous-buff edgings; head dark brown, the feathers edged with buff, which colour overspreads the back of the neck; through the lores a black stripe, and a smaller more indistinct one along the cheek; wing-coverts greyish cinereous; median and greater series tipped broadly

with white; a pale stripe above the eye; sides of the chest deeply tinged with buff; fore neck washed with buff (from Plate in Dresser's 'Birds of Europe').

Immature, first autumn (Wales). Interscapular region dark brown, with terminal buff-white spots; the scapulars with broader spots; the outer feathers with broad buff margins; the lesser wing-coverts at the point of the wing blackish brown; the greater series buff, with dark terminal bars; outer tail-feathers nearly white; face white, the lores pencilled with brown; the throat and chest faintly tinged with buff; the chest-feathers marked with fine cross pencillings.

Distribution.—This interesting and widely spread Stint has recently been procured in Ceylon. On the 12th of last December (1879) the collector of the Ceylon Museum met with a flock on one of the little islands at the mouth of the Negombo Lake, but only succeeded in shooting one specimen, a male in adult winter plumage. It is not unlikely that the Sanderling may visit the shores of Ceylon yearly as a straggler, and be completely overlooked, as comparatively few of the myriads of shore-birds frequenting the coasts in the cool season are ever shot.

In February 1875, Mr. Hume met with this species at Betra-par, one of the reefs in the Laccadive group. It may be, perhaps, not unfrequent on the coasts of Southern India; but it does not seem to have been often noticed there. On one occasion Jerdon encountered it at Nellore, and writes that it appeared to him to be tolerably abundant; but not knowing that it was rare in Indian collections, he only secured one specimen. I do not see it recorded from Bengal; but beyond the Bay it occurs along the coast at the mouths of the Irrawaddy, in which locality Dr. Armstrong met with it rarely. In Tenasserim, however, it has not yet been noticed; neither has it been seen on the shores of the Malay peninsula, although Schlegel records it from Java. It may not, therefore, range further south in this direction than the last-mentioned locality, although it extends eastwards into China, being general there in winter, according to Swinhoe.

In North-western India it is more abundant than elsewhere in the empire; for Mr. Hume found it common in Kurrachee harbour, and Mr. James writes of it occurring at Mandavee; it has also been met with in Sindh by Major Le Messurier. Northward it is found in Eastern Turkestan in autumn, migrating southwards, according to Dr. Scully. It probably passes through this country in spring, as Severtzoff says it occurs on passage in the north-eastern part of the country. As in Europe so in Asia, it reaches very high latitudes in summer, breeding in the very extreme north of Siberia on the Boganida, and frequenting likewise the Taimyr river as high as 74° N. lat. (*Middendorff*). Eastward in Japan it has been found on the south coast of Yezo. Turning westwards we find Canon Tristram procuring it on the coast of Palestine in winter. As regards the continent of Europe, it may be said to be a bird of passage throughout the southern portions generally, being found in some parts, particularly on the south coasts of Spain and in the Mediterranean islands, during the winter. In Great Britain it is likewise a bird of passage, though some, mostly young birds, remain throughout the winter; in Scotland it is common in autumn. In Scandinavia it is likewise a migrant, being observed in Norway and Sweden in spring and autumn; it passes through the Faroes, and is common in summer in Iceland. On the European shores of the Arctic Ocean it is also found in the breeding-season, although its nest has not yet been found there. Messrs. Seebohm and Harvie Brown met with it on the Golaievskai Islands, at the mouth of the Petchora Gulf, and also saw it at Dvoinik; but their visit was so hurried to these places that they failed to discover its eggs. Further east Von Heuglin has met with it on Waigats Island and the south of Nova Zembla; finally, as regards Russia, it has been procured on passage south at Kasan, and on its way north in spring on the Spara.

In Northern Africa it is found in the winter, many remaining in Morocco during that season, as also in Algeria and Lower Egypt, on the coast of which latter country Heuglin procured it in April and May already in summer plumage. In autumn and winter this naturalist says it is very common on the shores of the Red Sea, as far south as the Gulf of Aden. He found it most plentiful on the Somauli coast in October and November, but never observed it on the Nile. On the east coast of the continent it has been recorded from Mozambique and the coast of Natal, and on the island of Madagascar Mr. E. Newton procured it. It is a winter resident in Cape Colony, and is found on the west coast at Benguela, Gambia, Bissao, the Gold Coast, and Sierra Leone, taking in likewise the Canary Islands and Madeira into its range.

Dealing now with the Nearctic region, we find it on the east coast of Greenland breeding on Sabine Island, where the eggs were taken in 1869 by the German North-pole expedition. On the western side, Capt. Feilden met with it on the shores of Grinnell Land, but not abundantly; he, however, was fortunate enough to find it breeding in lat. 82° 33′ N., in the month of June, and met with *young* birds in August on the shores of Robeson's Channel. In North America it has been obtained in the Hudson's Bay territory and on the Mackenzie and Anderson rivers. Along the west coast it has been found from Alaska down to Cape St. Lucas, and also in the Aleutian Islands. Messrs. Sclater and Salvin record it from Peru, southward of which it has been met with on the coast of Chile; and in Central Patagonia Mr. Durnford procured it in the month of December at Tombo Point. Down the east coast of North America it has been procured in various places, and likewise visits Bermuda and also the West Indies, as Gundlach records it from Cuba. Finally we have it noted from Brazil.

Habits.—This cosmopolitan Stint resembles the rest of its family in its habits and economy, associating, however, not unfrequently with Sand-Plovers, to which, in the absence of its hind toe, it bears a trifling resemblance. It also consorts with larger birds, such as Oyster-catchers and Godwits. Von Heuglin remarks that it carries its neck more drawn in than other Stints, and also the bill and head more forward. When flying, and also on the approach of danger, he observes that it utters its note, which he likens to *zi* or *schri.* It is less active than these birds in its movements. Captain Feilden found it feeding in the far north on the buds of the *Saxifraga oppositifolia*, a diet which Knots and other species likewise take to in those regions. He also observed small parties of young ones following their parents, and searching most diligently for insects.

Nidification.—Although the Sanderling has such a wide circumpolar distribution, its eggs have very seldom been found, and as yet they have only been taken in very high latitudes. Macfarlane found a nest with four eggs on the Anderson River, and describes it as composed of hay and decayed leaves. One of these eggs was exhibited by Professor Newton at a meeting of the Zoological Society in 1871, and is figured on pl. iv. fig. 2 of the 'Proceedings' for that year. The same naturalist exhibited in that year the eggs sent from Dr. Finsch as having been procured on Sabine Island, and which agreed with that from Anderson River. Another egg, bought in Iceland in 1858 by Professor Newton and Mr. Wolley, is identified as being almost unquestionably a Sanderling's.

The nest Captain Feilden found "was placed on a gravel ridge, at an altitude of several hundred feet above the sea; and the eggs were deposited in a slight depression in the centre of a recumbent plant of arctic willow, the lining of the nest consisting of a few withered leaves and some of the last year's catkins." "The eggs," writes Mr. Dresser, "may best be described by comparing them to miniature Curlew's eggs of a pale colour. In size they are about equal to those of the Wood-Sandpiper."

Page 900.—*Strepsilas interpres.* Two specimens shot on the coast of Wales in full breeding-plumage, on the 27th May, demonstrate the superior size of the female; the measurements are as follows:—♂, wing 5·9 inches; ♀, wing 6·1.

Page 934.—*Charadrius fulvus.* With reference to Layard's statement, in the 'Ibis,' 1879, that this Plover breeds in New Caledonia, and to which I refer at page 936, he writes me recently that there is no question about the matter, and that had his son known that the species had not hitherto been found breeding south of the equator, he would have shot specimens of old and young. While on the island referred to (Ansevata) the birds were several times close to him, so that he could not be mistaken in his identification.

In Mr. Parker's last letter is contained a very interesting announcement concerning this species, namely that Mr. Goonewardene, Assist.-Sup. of Tanks in the N.W. Province, had sent him a Golden Plover's egg, *taken out of a bird shot in April.* It is difficult to believe that this example would not have bred in low latitudes. Some of the eggs brought to Swinhoe in Formosa may, after all, have been those of this species.

Page 1059.—*Podiceps fluviatilis.* Mr. Parker writes me that this species is common in the N.E. Province and N. Province.

Page 1066.—*Nettapus coromandelianus.* According to the same authority, the Goose-Teal is common in the Northern Province.

Page 1070.—*Tadorna casarca.* This Sheldrake can no longer be relegated to the doubtful or unprocured species in the Ceylon lists. Mr. G. Simpson, of the Indian Telegraph Department, has lately sent a portion of the skin of a male shot by him in the Jaffna district to Mr. Parker for identification. He likewise furnishes a description of the bird, which has been forwarded to me, and there is no doubt about the matter. The wing of the example in question measures 14·75 inches. Mr. Simpson says that they are not uncommon in the cool season on the Jaffna lake, near Pooneryn, and on the Delft, Palverainkadoo and Mullaittivu lagoons. They are, he finds, very wary, flying high when disturbed, and uttering a note like *conk, conk.*

Page 1073.—*Anas pœcilorhyncha.* Mr. Simpson has met with this species on the Palverainkadoo lagoon. He likewise is of opinion that he has seen the Mallard in the same locality. I recommend the procuring of this latter species to collectors in Ceylon, so that the doubt may be cleared up.

Page 1092.—*Phœnicopterus roseus.* Mr. Simpson sends word through Mr. Parker of a large flock of Flamingoes having been met with by Mr. Clarke, of the Forest Conservancy Department, on the Jaffna Lake, during June of this year. This interesting record of the occurrence of the species in the island during the S.W. monsoon shows that it is partly resident there. The same gentleman informs me that *he* has only met with it on the N.W. coast between the months of November and April.

Page 1096.—*Platalea leucorodia.* Mr. Seebohm observed this species, during the recent nesting-season in Holland, breeding in great numbers on the ground. As many as fifty nests were placed within a space of twenty square yards. They were made on large tussocks of grass, the foundation being of sticks, and the body of the nest of reeds, lined with grass.

Page 1103.—*Anastomus oscitans.* Mr. Parker finds the "Shell-eater" common in the vicinity of the Giants' tank.

Page 1109.—*Plegadis falcinellus.* Mr. Wickham, of Holmwood Estate, Lindoola, informs me that he has seen the Glossy Ibis on the Bopatalawa Patnas, and lately procured four specimens! These birds must have been on passage north from the south-east coast; but it is singular that they should cross the mountains and be found at such an elevation, 5000 feet.

Page 1147.—*Bubulcus coromandus.* This species was procured in Sumatra in 1878 by Mr. Carl Bock.

Page 1153.—*Butorides javanica.* Governor Ussher remarks that this Bittern is moderately common on rocks along the sea-shore of Labuan. Its native name there is "*Ulun tukugong.*"

Page 1162.—*Ardeiralla cinnamomea.* This Bittern has again been recorded from Sumatra, where Mr. Carl Bock recently procured it.

Page 1182.—*Phalacrocorax carbo.* An interesting account of the training of Cormorants in China has recently appeared in 'The Ibis,' 1880, p. 375. The Editors remark that, though the Chinese species is called *P. sinensis*, it is doubtful whether the bird is "distinct from the *P. carbo* of our seas." I have no doubt but that it is *the same*; it is united with it by Messrs. Swinhoe and David; and in my treatment of the species I have considered it merely a small race like the Indian bird. I append the following extract from the article in question, which originally appeared in the 'Special Catalogue of the Ningpo Collection in the International Fishery-Exhibition at Berlin':—"The young birds are at first fed with a mixture, in equal parts, of beancurd and raw eel's flesh cut fine. If eels are not procurable, the flesh of the *Hei yii* (*Ophiocephalus niger*) is used instead, in the form of small pills. At the end of a month the down begins to be covered by the larger feathers, and the quantity of fish-flesh given to them is increased, while that of beancurd is reduced. A second month elapses, and the young birds, having grown to double their original size, are fit for the market; a male fetches 1 or 2 dollars, and a female half as much.

"The birds are now fed with young fish thrown to them. When they have attained their full size, a string is tied to one leg, the other end of it being fastened to the bank of a pond or canal. They are then made to go into the water, the trainer whistling a peculiar call and using a bamboo to force them. Small fish are thrown them, upon which they pounce greedily, as they have been kept on short allowance of food. They are now called back by a different whistle-call, and forced to obey by means of the string; as they reach the shore more fish is given them. This teaching having been gone through daily for a month, another four or five weeks are spent in training the birds from a boat; at the end of this period the string is generally dispensed with. When old and well-trained Cormorants are made to accompany the young ones, the time required in training is reduced one half. Birds not properly trained after all the trouble thus taken are pronounced stupid and not fit for use.

"The teaching being completed, the Cormorants are fed sparingly every morning with fish. A small ring of hemp is tied around their necks to prevent them swallowing large fish, and they are taken on board the small punt called 'Cormorant-boat' to the number of ten or twelve. They are now as docile as dogs, and sit perched on the side of the boat until they are sent into the water by a mere whistle from their master. They dive after fish, and bring their prizes to the boat, firmly held in their hooked beaks. When a fish is too large for one bird, three or more join their forces and capture it together. Sometimes the fisherman signals them to dive by striking the water with a long bamboo. If any Cormorant is inclined to be disobedient, his legs are connected by a short piece of string; this forms a loop, by means of which the bird may at any moment be brought on board, *nolens volens*, with a long bamboo hook.

"After fishing two or three hours the birds are allowed to come on board and rest. At the end of the day the hempen ring is loosened or removed altogether, and they are either allowed to fish for themselves, or are fed by the hand of their master. Seizing the birds one after another by the upper mandible, the fisherman thrusts into their throats a handful of small fish and a ball of beancurd as large as his fist, the ingurgitation of which he helps with the other hand by stroking the neck of the bird, who seems to enjoy it, as he promptly returns for a second supply. The entire scene is most ludicrous. At night the birds are brought home and caged. A Cormorant holds out for five years, at the end of which time these birds lose their feathers and soon after die. The females, being weaker than the males, only catch small fish, hence their lower value. Very good birds reach a value of Fls. 10 a pair, a well-trained male being worth 6 or 7 dollars. The females lay when one year old."

APPENDIX II.

Pages 205, 1212.—*Brachypternus intermedius.* In view of the evidence sent me by Mr. Parker, on reconsidering the matter I have added this species as a *bonâ fide* one to the Ceylon lists; but whether it will stand under the above name, and as *peculiar* to Ceylon, I cannot say with certainty.

Page 272.—*Anthracoceros coronatus.* This Hornbill breeds in the N.W. Province in April, choosing a Koombook-tree sometimes to nest in. An overseer of Mr. Parker's found a nest in the beginning of April of the present year. It was in the trunk of a tree about 15 or 18 feet from the ground; the hole was plastered up, leaving a small opening. There were two eggs, much discoloured, in the hole.

Pages 275, 1213.—*Tockus gingalensis.* A nest found in April last near Ballalli, N.W. Province, was situated in a large Koombook-tree, in a hole about 20 feet up the trunk from the ground; the orifice was plastered up so that there was barely space for the introduction of the hand. In the nest were imprisoned the mother and three young ones, two of which were so far advanced as to be able to fly! It is surprising that they were still undergoing imprisonment. The nest was found by a trustworthy *employé* of Mr. Parker's, who vouches for the truth of the man's statement.

Pages 303, 1213.—*Ceyx tridactyla.* Mr. Parker writes me of finding the nest of this beautiful species, the first that has been discovered in Ceylon. It was situated in the side of a small streamlet near the Aruvi aru; the depth of the hole, which sloped slightly upwards, was 18 inches and its diameter 2 inches, while the cavity where the eggs were deposited, and in which there was no nest, was 3 inches high and 5 inches in diameter. The eggs were three in number, pure white, and with the ends not so round as in other species; they measured 0·77 by 0·6 inch. The date of finding the nest was July 23rd.

Pages 328, 1214.—*Dendrochelidon coronatus.* The same gentleman was fortunate enough to find, on the same day, one of the beautiful and diminutive nests of this Swift. It was so small that when he perceived the bird sitting across a small branch of a young tree no nest was visible; but when she flew off something like a small excrescence or knot projecting on one side of the branch could be perceived. The nest was *one inch* in internal diameter and half an inch deep, and was constructed of tiny bits of the outer bark of trees, agglutinated together with the bird's saliva. The branch was not more than $1\frac{1}{2}$ inch thick; and when the bird sat on the nest the whole of the breast on one side of it and the under tail-coverts on the other were visible, showing how exceedingly small was the nest. It contained one young one, which entirely filled it.

Pages 366, 1214.—*Pericrocotus peregrinus.* Eggs of this little Minivet, sent me by Mr. Parker, vary somewhat. One specimen is greenish white, spotted with umber and dark brownish purple, these markings forming a zone round the large end, and becoming very small and scanty on the smaller half of the shell; the underlying markings are bluish grey and very small. The specimen is characterized by the openness and smallness of the spots; it is of the usual ovate-pyriform shape, measuring 0·72 by 0·51 inch. Another example is white, with rather large longitudinally directed spots of pale red of two shades overlying largish spots of bluish grey. The markings, though largest at the obtuse end, are pretty evenly distributed over the whole surface. It measures 0·68 by 0·52 inch, and is much more stumpy in shape than the last-mentioned. These eggs are accompanied by one of the nests alluded to, p. 1214. The entire structure measures only 2 inches across by $1\frac{1}{2}$ in depth, and is exceedingly beautiful, the spiders' webs binding the stalks together being mixed with wild cotton and feathers; there are a few pieces of tiny twig in the body of the nest, and there is no lining, the interior being much rougher than the neatly finished-off edge of the "cup."

Pages 372, 1214.—*Tephrodornis pondicerianus.* An egg of this Bush-Shrike, received from Mr. Parker, is a very short broad ellipse in shape, covered with very large markings for the size of the egg, and which consist of blotches and spots of olive-brown, with some streaky markings of the same at the small end; beneath these lie numerous blotches of greyish blue, collected chiefly at the large end. The egg measures 0·77 by 0·64 inch.

Pages 383, 1215.—*Lanius caniceps.* Eggs of this Butcher-bird which have arrived in England since the above note (p. 1215) was written are white faintly tinged with green, and openly spotted with clearly-defined, roundish, medium-sized spots of brownish lilac and greenish brown, over smaller spots of pure bluish grey; the spottings are thicker and larger at the obtuse end, but are not confluent at all there. They are short thick ovals, rather obtuse at the large end, and measure 0·92 by 0·71 and 0·91 by 0·69 inch.

Pages 449, 1215.—*Turdus kinnisi.* The British Museum has just acquired a most valuable addition to its Oriental collections, viz. a series of birds collected in the Travancore hills by Mr. Bourdillon. Among them is a specimen of the Blackbird referred to in my "Observation," p. 450, and with which, owing to Mr. Hume's remarks, I was led to unite our bird. Messrs. Sharpe and Seebohm, however, pronounce the specimen in the national collection to be distinct from the Ceylonese bird. I therefore accept their dictum and restore *Turdus* (*Merula*) *kinnisi* to its rank as a "peculiar" Ceylonese species, and regret now that I did not figure it at the time of writing my article. Only two specimens of the Travancore bird have been procured by Mr. Bourdillon—the one in the British Museum collection, and one which Mr. Hume has, and which I formerly referred to.

Pages 574, 1217.—*Dicæum erythrorhynchum.* The nest alluded to in my note p. 1217 has been sent to me, and is an exceedingly beautiful little structure. It is a "purse" domed at the top, and with the opening just beneath the dome about $\frac{3}{4}$ inch in diameter. The length of the nest is about $2\frac{1}{2}$ inches, and its breadth 2 inches. It is chiefly made of native cotton mixed with very fine bark-fibres, particularly round the orifice. The interior is entirely cotton.

Pages 718, 1218.—*Carpophaga ænea.* A nest of this Pigeon, found near the Giants' tank by Mr. Parker, July 21st, was built in the top of a young leafy tree; it was slightly more substantial than the nest of the Pompadour Pigeon, and was considerably thicker. It contained one egg, which measured 1·65 by 1·30 inch.

Pages 728, 1218.—*Osmotreron pompadora.* An egg just received from Mr. Parker, taken at the Giants' tank, is a short very broad ellipse, pure white, with a little gloss and a *slightly* rough texture, and measures 1·02 by 0·88 inch. It is small for the size of the bird. The breeding-season in the north extends to the end of July.

Page 1217.—*Alauda parkeri.* Mr. Hume writes me, since the note on p. 1217 was written, that the specimen I sent him of this bird is the young of the southern form of *Alauda gulgula.* The bills, however, of this specimen and another are so very large and conical (much exceeding in thickness the largest full-grown examples of *Alauda gulgula*) that it is difficult to accept Mr. Hume's identification. Nevertheless, as I know this species varies so much in the bill, I will expunge this supposed species from my list of peculiar birds in the Introduction; but will allow it to stand as a doubtful species in the "Systematic Index."

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